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PART I.

Original Contributions.

ON THE PATHOLOGICAL CHANGES IN SYPHILITIC
CHOROIDITIS AND RETINITIS.

(With PLATES I, II, III, IV.)

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ALTHOUGH from time to time opportunities must have occurred to many of examining specimens of active syphilitic disease of the choroid and retina, and though many other observers are doubtless familiar with specimens like those described below, I do not know that any series of illustrations of the morbid changes in question has been published. Even in one of the latest and most elaborate monographs* on syphilitic diseases of the choroid and retina, in which the literature of the subject has been very thoroughly worked up, but little space is given to the pathological anatomy of such cases. Whilst not hoping to add anything new to the natural history of these affections, I believe that the illustrations now given will be of interest, since they are carefully

* Ole Bull (of Christiania), "The Ophthalmoscope and Lues." 1884.

drawn from good sections of specimens, the clinical history of which is tolerably complete.

The *changes in the choroid* in syphilitic choroiditis are such as the ophthalmoscopical appearances would lead us to expect; we find collections of cells in the choroid, similar effusions between this coat and the retina, and attenuation of the choroidal structures following absorption of the inflammatory products; multiplication of the pigmented epithelial cells which, though morphologically belonging to the retina, are for the purposes of descriptive anatomy more conveniently retained as part of the choroid, can be well made out in some specimens. So far as I have seen, the choroidal changes always begin in, never upon, this tunic, the exudations upon its retinal surface occurring later from extension inwards of luxuriant cell growth; indeed, that such epichoroidal growths occur at all is perhaps due to the inflammation of the choroid having for its first and principal seat the capillary layer.

The earliest change consists in the occurrence of minute collections of small round corpuscles like leucocytes immediately beneath the elastic lamina; the pigment epithelium adheres rather more firmly over these spots than elsewhere, probably because it early becomes mingled with inflammatory corpuscles which have either passed through the elastic lamina or been produced from the nuclei of the pigment cells themselves. (Plates I and II, and woodcuts Figs. 2 and 3.) There seems to be more tendency towards lateral extension of the cell growth in the chorio-capillaris than towards an invasion of the deeper layers, so that even in very severe cases the deepest layer, the lamina fusca, may remain tolerably free (Plate I). In this respect, and likewise in the absence of marked microscopical signs of degeneration, we find a great contrast with miliary tubercle of the choroid; miliary tubercles invariably begin in the deeper layers, and the centre of the growth soon passes into caseation. I have not succeeded in tracing all the steps between the stage of active exudation and of atrophy in syphilitic choroiditis, but

in the specimens from Case 7 abundant cell growth was still present, in some parts of the choroid which were nevertheless considerably thinner than natural, and in fig. 2, Plate III, some excess of nuclei is still present, even though the choroid is markedly thinned. It would probably not be true to say that epichoroidal effusion stands in direct relation to the amount of strictly intrachoroidal inflammation, for the ophthalmoscope shows that severe and extensive choroiditis often occurs and results in complete atrophy of this membrane without evidence of any effusion between it and the retina. Doubtless such epichoroidal effusions are sometimes quite absorbed, if we may judge by the changes in ophthalmoscopical appearances at different dates in the same case; but there is certainly a marked tendency towards their organization into permanent fibrous tissue by which the retina and choroid are bound together, such fibrous tissue being shown by the ophthalmoscopical appearance of greyish-white patches, often with spur-like or linear processes, and bearing much resemblance in pattern to patches of keloid on the skin or of old false membrane on a serous surface. The illustration in Liebreich's Atlas, Plate V, fig. 1, shows a somewhat similar appearance in an early and curable stage, and Plate I. below, shows the microscopical appearances in such a case. Tough fibrous membrane closely investing the inner surface of the choroid is familiarly known as a consequence of severe choroiditis from other causes than syphilis, and furnishes the usual nidus for the formation of bone in the eye; whether bone ever forms in the syphilitic membranes I am unable to say.

The *changes in the retina*, so far as my specimens show, agree fairly well with what the ophthalmoscopical appearances foreshadow. There is a general thickening of all the layers, but little tendency to the clumps of inflammation which characterise the choroiditis. The thickening is not, as in renal retinitis, due chiefly to œdema; nor do we, as in that disease, find hæmorrhages or lumps of amorphous or fatty material between the fibres of the connective framework. Although the thickening implicates all the layers,

it is, in my specimens, most marked in the nerve-fibre layer, where a great excess of stained corpuscles is found (Plate I and Plate IV, fig. 1). A similar increase of nuclei is found in the optic disc, on the inner surface of which the cells may even fill up the physiological pit and pass insensibly into the similarly changed hyaloid membrane. Well-defined collections of cells are, however, occasionally met with in the nerve-fibre layer, and one such is shown in woodcut Fig. 1. Very marked changes are seen in the arteries and minute blood-vessels of the retina, their coats being thickened and often crowded with small deeply-stained cells (Plates I and IV).* In the very late stage of a severe and widespread case the retina was thinned, some of its layers indistinguishable, and the blood-vessels, both small and large, ensheathed in pigment and their lumen often obliterated. Such retinitis pigmentosa, secondary to choroiditis, is a condition often found in eyes blind from chronic inflammation, due to other causes than syphilis.

The specimens described below throw but little light on the relation between syphilitic inflammation of the retina and of the choroid. They illustrate the law that whilst retinitis is usually widespread and diffuse, choroiditis is more often patchy and discrete. They also fit with the clinical experience that, although the ophthalmoscopical signs of syphilitic choroiditis and retinitis are very often found together, either may occur without the other; and that, when both retinitis and choroiditis are present, the choroidal deposits may sometimes be found only in some one part, such as the yellow spot region, being entirely absent near the disc, whilst, nevertheless, the disc and immediately adjacent retina may show marked changes (Case 5). Although we have been taught to believe, chiefly by Professor Förster, that the retinitis in syphilis is for the most part a consequence of the choroiditis, and, although no doubt there are many cases where this may very well be true, I think it cannot hold good of all. But neither does it seem possible to accept the

* See also Brailey and Edmunds, these Reports, vol. x, p. 137.

position so ably defended by Dr. Ole Bull,* that the reverse is the rule, the choroiditis being secondary to the retinitis. The mere fact that there are cases in which the only change is the presence of sharply-defined, punched-out patches of atrophy following syphilitic choroiditis, without the slightest ophthalmoscopic evidence of disease of the retina, is enough to prove that Bull's position cannot be universally true. Probably both doctrines are true; long-standing severe retinitis, whether syphilitic or, *e.g.*, due to Bright's disease, is apt to produce disturbance or absorption of the pigment epithelium, and thus to cause appearances which it is impossible to distinguish from those indicating a previous superficial choroiditis,—the result to the pigment epithelium being probably much the same in the two cases. The gradual appearance of such changes, producing changes like those due to primary choroiditis, but coming on in the course of a very chronic case where, for a long time, nothing whatever except diffuse haze of the retina could be made out, is well illustrated in the first of the two following cases; acute diffuse central retinitis with extreme defect of sight coinciding with an area of choroidal disease, strictly confined to a limited and far distant part of the fundus, is equally well shown in the second case.

CASE 1. John Hanly, 31, an Irishman, was admitted at the South London Ophthalmic Hospital in December, 1877. He had had a chancre about six months before, and still had sores on the lips, tongue and palate. The sight had failed in both eyes for about two months, and was now very defective, especially at night. In both, the central region of the retina was uniformly very hazy, the haze being for the most part beneath the large vessels. No trace of choroiditis was visible anywhere. In the right there were some fine dust-like opacities in the vitreous, and one or two iritic adhesions; in the left the iris and the vitreous were healthy. He was a careless man and soon disappeared. In November, 1878, he was again under me, at St. Thomas's Hospital, as an in-patient, but would only stay a few days. The ophthalmoscopic appearances had not altered;

* Ole Bull, *loc. cit.*

he read 14 J. with the right and 13 J. with the left. I saw no more of him till February, 1882; he had had no treatment in the interval, and the sight had become worse (R. not $\frac{20}{200}$, L. $\frac{20}{70}$ and 8 J.). In the right there was not now much general haze, but a large whitish patch was seen, apparently beneath the retina, at the yellow spot; disc not pale, arteries of good size; the defect was presumably accounted for by the patch at the yellow spot. In the left there were some large, slowly floating opacities in the vitreous, much haze of retina about the disc and yellow spot, but no haze at the periphery, disc hazy and pale, arteries rather small; some small, much pigmented spots of choroidal disease thinly scattered about the yellow spot region and at the periphery. He still attends about once a year, and now (Summer, 1885) he can hardly see his way about. As he never would take medicine, his case affords a good instance of the unhindered progress of a bad syphilitic retinitis.

CASE 2. Frederick Eldred, æt. 29, had a chancre in the early part of 1880, followed by an eruption on the forearms, ulceration of the tongue and falling of hair. About January 1st, 1881, a dimness began to come over his left eye "from the inner to the outer side; there was much flickering, blue mists, and coloured spots," but he did not notice any variations of sight. Dr. Gowers, under whose care he had been for old epilepsy, sent him to me three weeks after the failure began (January 18th). At this date with the left eye he could only see fingers moving, and best in the temporal part of the field. There were some pigment dots on the lens-capsule, a bee's-wing opacity deep in the vitreous, and diffuse retinitis. The retinitis caused a whitish haze over the whole central region, which was especially dense at a patch downwards and outwards from the disc; disc but little swollen, and not so hazy as the surrounding retina; veins and arteries all somewhat tortuous, and here and there partly obscured by haze. Right eye healthy. A month later, as he did not improve under out-patient treatment, I took him in for inunction. The ophthalmoscopical appearances were the same, and at the extreme outer part of the periphery I now found a large area of disturbed pigment epithelium, apparently indicating superficial choroiditis; no doubt this was present at the former

examination, though I did not see it. He was now put on mercurial inunction from February 7th to 10th, then, as there was no effect, on calomel and opium pill every four hours. Salivation began on 12th, when mercury was omitted; on the 14th he was freely salivated with diarrhoea and tenesmus; he could to-day count fingers with L. at one foot.—21st. Had an attack of temporary almost complete blindness in R.; sight came back perfectly in 10 minutes; nature of attack doubtful; a systolic murmur was heard at apex of heart. On the 24th L. made out letters of 20 J.—March 21st. L. reads 4 J. held close, but it looks much smaller than to the other eye; has been taking iodide of potassium nearly all the time, and during the last month a little mercury has been resumed; mercury now further increased.—March 24. Made an out-patient.—March 28th. Flickering complained of in L., so that he likes to close it.—April 14th. Still flickering and micropsia, V. 8 J. at 6".—21st. 4 J. at 6".—April 28th, V. 6 J. Latterly he had again many fits, though he was taking bromide, and as he was getting worse he was sent back to Dr. Gowers on May 12th. Careful ophthalmoscopic examination was made at that date; the vitreous was quite clear; optic disc and retina still slightly hazy; a few isolated black dots not far from the disc; peripheral area of choroidal disease unchanged.

CASE 3 (with Plate III, fig. 3, and Plate IV, figs. 1, 2, and 3). Mary Ann B., æt. 40, single, of small stature, subject to chronic rheumatism, was an in-patient in St. Thomas's Hospital from February 11th to June 5th, 1879, for obstinate plastic iritis of both eyes. The notes of the case (I. P. Book, p. 191, and Path. Book, No. 147) are not very full, as the woman was dull, and gave but a meagre account of her symptoms. She had, however, on admission an eruption of dusky, circinate spots on the back of the neck, and said that she had lately had a sore throat lasting for a month; she complained of general weakness and pains in different parts of the body. I had no doubt whatever at the time that she was suffering from secondary syphilis.

On admission there was iritis in each eye, with many adhesions, T. n., V. less than $\frac{20}{200}$, dull reflex from fundus, but no

details visible. Half a drachm of strong mercurial ointment was rubbed in daily for a few days, when, as she was salivated, it was stopped. Mercury was resumed by the mouth soon after, and was continued till her discharge. Three weeks after admission the L. eye counted fingers at 6', the disc was visible, but seen through a haze; the R. had only p.l. Later, March 31st, the R. was beginning to soften, and although the eye was neither congested nor tender, she was complaining of neuralgic pain passing from the right eye across the forehead. There is no note for the next six weeks. Then, on May 15th, it was noted that she "still has attacks of severe pain, chiefly in R. side of the head, in connexion with brief attacks, often lasting only a few hours, of redness and tenderness of the R. eye." At this date, in the R. eye, there was ciliary congestion, dulness of aqueous and no p.l., but T. was n.; the corresponding side of the scalp was tender and sore. As the eye had remained troublesome for so long, in spite of mercury, atropine and leeches, and was quite useless, I removed it on May 16th.

The eye was opened by an equatorial section at once. The vitreous, detached from the hinder part of the eye, was shrunken to less than a half of its full size—was too firm, slightly hazy, and streaked with denser opacities. Examined whilst fresh, it was found crowded with corpuscles of various shapes and sizes, some being round, others tailed and continued into long branching processes. A few of these cells were quite fatty. There were no blood-corpuscles. There were none of the large mother-cells containing numerous corpuscles which are sometimes seen in specimens of inflamed vitreous. The clear colourless fluid between retina and detached vitreous was not further examined. The whole retina showed a slight milky haziness, and, in addition, there were three spots of much denser haze, from whose borders spur-like, apparently puckered processes were given off resembling in a minor degree Fig. 1, Plate X, in Liebreich's Atlas. Two or three of these patches lay exactly over round spots of white choroiditis; two or three other spots of choroiditis were present, but not obscured by patches of retinal haze; several white spots were also seen on the pars plana of the ciliary body; disc very hazy, but not obviously swollen. After hardening, sections were made of the retina and choroid; but although the spots of choroiditis were easily found, the

patches of retinal opacity could not be definitely made out. In the choroid a moderate number of small growths, consisting of pus-like cells, are found in the chorio-capillaris; sometimes the elastic lamina is raised up over them, but usually not. In some places precisely similar cells lie over the growth on the inner (retinal) surface of the elastic lamina. The cells in the choroidal deposits are usually just like the white blood-corpuscles in the adjacent vessels, but some are larger and oval. In some sections there is a more diffused cell-growth, but in no part is the choroid decidedly thickened, nor are its vessels much distended. Retina thickened throughout, bacillary layer degenerated, great increase of nuclei in the nerve-fibre layer (Plate IV, fig. 1), very marked increase of nuclei in the coats of the small blood-vessels (Plate IV, figs. 2 and 3). The aqueous humour in the hardened specimen coagulated into a soft jelly. The iris, besides diffuse cell-infiltration, shows a well-marked cell-clump close to its pupillary border between the sphincter muscle and the anterior surface (small gumma); this cell-growth is well shown in Plate III, fig. 3, *g*; it does not occasion any localised swelling.

CASE 4. (With Plates I and II, and Plate III, figs. 1 and 2.) Charles T. was under the care of Mr. Brudenell Carter, at the South London Ophthalmic Hospital, for interstitial keratitis with iritis, from March, 1876, to January, 1877; the iritis was severe, leading to closure of pupils. The disease had begun some months before his admission. In January, 1877, when there was still much corneal haze, the left eye was ruptured by a poke from an umbrella-stick, and ten days' later was excised by Mr. McHardy for Mr. Carter, and kindly handed to me (Path. Book, No. 92). There was a large rupture, or lacerated wound, occupying the upper and inner part of the marginal region, involving both the sclerotic and the cornea. The wound had closed and was slightly puckered, but not inflamed, and the globe was very soft. On opening the fresh specimen the vitreous was found blood-stained and fluid, and a blood-stained mass was situated on the ciliary body near the wound; lens absent; no other changes attributable to the accident. Tunics *in situ*; a tract of pigmented choroidal disease near the equator, the retina over this part being adherent, and showing patchy opacity. The choroid

and retina, with this exception, looked healthy to the naked eye. The cornea was hazy, especially at its lower part.

After hardening in equal parts of spirit and Müller's fluid, sections were made of the cornea and ciliary region opposite to the rupture, of the disc and surrounding parts, and of the choroid and retina at the diseased area.

The cornea was considerably thickened, and contained many vessels at various depths; many of these, entering the deep corneal layers from the sclerotic, came nearer to the anterior surface as they approached the centre of the cornea; a well-marked, muscular coat was visible in some of the vessels. Small cells like white corpuscles were scattered throughout the cornea, especially around and near to the blood-vessels; they seemed to lie between the corneal corpuscles, the latter bodies themselves being flat and unaltered. The epithelium of Descemet's membrane normal; Bowman's membrane hardly appreciable. There is a layer of thickly nucleated tissue (episcleritis) on the sclerotic in the ciliary region, but it gradually thins off posteriorly; the veins in this layer are enormously distended. There is increase of nuclei in the deepest layer of the sclerotic at the attachment of the ciliary muscle and Descemet's membrane (true deep scleritis). The immediately contiguous part of the ciliary body, just around the *circulus arteriosus major*, shows a dense aggregation of nuclei; the ciliary muscle itself is infiltrated with cells, but shows no circumscribed collections; very little, if any, change in the ciliary processes.

The above changes are partly attributable to the old keratitis, partly, no doubt, to the injury.

The anterior part of the choroid shows changes which are certainly older (Plate I); the whole choroid here is thickened and its veins immensely distended, and it shows several centres of intense nucleation; the pigment of the choroid proper is not increased; the epithelial pigment is irregular, in some places absent or scattered, in other parts heaped up, and apparently increased in quantity; the retina is adherent to the choroid at many spots by fibrous tissue, which seems to have grown through gaps in the elastic lamina of the choroid, and have then made its way in a horizontal plane between the two tunics; the corrugated elastic lamina is easily traceable beneath much of this epichoroidal growth, but in places it is invisible

for considerable distances. The retinal layers in this part are much altered and the whole retina thickened; the bacillary layer is absent at the adherent spots. The parts just described correspond with the tract of pigmented choroidal disease with adherent retina above-mentioned, near the equator.

In other parts of the choroid, foci of growth composed of small pus-like corpuscles, with minute, often multiple, nucleoli, are found; these are minute gummata. When very small these cell growths almost always lie in the chorio-capillaris (Plate II, figs. 1 and 2). Sometimes a mass of cells in the chorio-capillaris is continuous with a similar collection on the inner surface of the elastic lamina, through which the cells appear to have passed (Plate II, Fig. 2), causing disturbance of the pigment epithelium; one gumma shows commencing degeneration at its centre (Plate III, fig. 1). These choroidal growths differ from tubercle by their small size, the absence of giant cells and of reticulum, and the want of any relation to the choroidal arteries; the gross choroidal disease described near the equator (Plate I.) no doubt resulted from the confluence of numerous gummata.

One section traverses a patch of atrophied choroid which looked pale to the naked eye. The choroid in this patch is much thinner than elsewhere (Plate III, fig. 2), and the capillary vessels have almost disappeared; but it still shows a slight excess of nuclei; the deep pigment is unaltered; the epithelial layer was lost in making the section.

There is general thickening of all the layers of the retina in all parts, and of the optic disc, due partly to oedema, partly to increase of connective tissue. Müller's fibres are elongated, and in parts separated by spaces, and their nuclei near the limitans interna are increased so as to form a distinct layer. The retinal arteries are much thickened and hyaline-looking, and around the vessels in and near the disc there is marked increase of nuclei. It is difficult to find any muscular coat to the arteries, and they are distinguished from the veins chiefly by the greater thickness of their walls. The growth causing this increased thickness is not, however, in the muscular coat, nor in the intima, but in the adventitia, and consists of small round cells much more deeply stained than the muscle nuclei, and distinguished from the leucocytes in the vessel, by the latter being always

segmented into three or four parts. There is sometimes a space between the muscular coat and the thickened adventitia (perivascular space). These changes are certainly most marked in connexion with the arteries; no well-marked alterations are seen about the veins, though in some sections vessels (? veins) are seen with general fibrous thickening of their inner coats, without marked increase of the nuclei of the adventitia. There is a similar change in some of the choroidal arteries. The ganglion cells are quite normal. There is well-marked inflammation of the hyaloid in the physiological pit. The choroid shows hardly any change near to the disc, except one or two small centres close to the border of the disc in the chorio-capillaris, with epichoroidal growth upon them by which adhesions are formed with the retina; at the apex of one of these growths the lamina elastica is wanting, whilst in a section nearer its base this membrane is traceable over the whole growth.

There is much inflammatory change, partly old, partly new, on the flat part of the ciliary body.

The cells or corpuscles found generally throughout the cornea, episclera, sclera, ciliary muscle, and the choroid and retina, are of pus-like size and appearance. In certain parts, however, cells of quite different aspect are found. These are of much larger size, round or oval, and much more intensely stained by logwood than the small cells. They are found scattered, either singly or in considerable numbers, in the episcleral tissue, along some of the perforating scleral vessels, throughout the whole thickness of the ciliary muscle and the layer of connective tissue between the muscle and its epithelial pigment. They are absent from the cornea, membrana suprachoroidea, choroid and retina, including the "ciliary retina." Probably these large, deeply-staining cells are related to the traumatic inflammation, and not to the syphilitic disease, from which this eyeball suffered.

Reference may also be permitted to the following specimens, accounts of which have been already published, and which I have again carefully examined for the present paper.

CASE 5. John H., aged 15 months; case published by Dr. Barlow, in the Transactions of the Pathological Society, vol. xxviii, p. 291 (Path. Book, No. 93), with the following heading: "Gummata on Cranial Nerves; Disease of Cerebral Arteries; Cicatrices of Liver and Spleen, in a case of Congenital Syphilis." Dr. Barlow had examined with the ophthalmoscope and found no changes. I examined the back of one eyeball, and reported to Dr. Barlow that I could find no definite changes. This statement I regret, as a more careful examination of the same sections has since shown at least one definite, limited exudation of small cells in the inner part of the choroid. There is also considerable thickening of the retina near the disc (the sections do not extend far from this part), a very well defined circular mass of small cells, like those in the choroid, in the nerve-fibre layer (Fig. 1), and marked thickening of the coats of several retinal arteries with increase of their nuclei. The retina is not well enough preserved to admit of any more precise description.

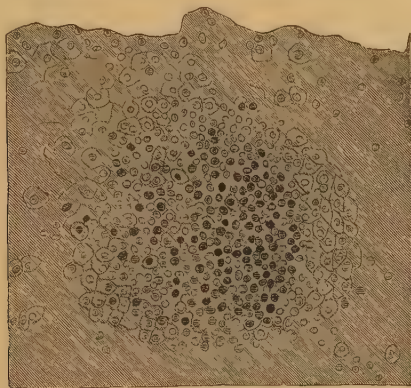


FIG. 1.—Collection of cells (small gumma) in the nerve-fibre layer of the retina. The upper boundary is the inner limiting membrane. $\times 220$.

CASE 6. Elizabeth W., also Dr. Barlow's patient, and published in the Pathological Society's Transactions, vol. xxviii, p. 287 (Path. Book, No. 27). The case is headed "Meningitis, Arteritis, and Choroiditis in a Child, the subject of Congenital Syphilis." At the age of about 9 months Dr. Barlow found

with the ophthalmoscope the following appearances: "Sparingly distributed very small flecks of exudation of brownish colour, apparently situated in the choroid. There was scarcely any disturbance of pigment, and no atrophy. So far as I could judge, there was no alteration in the optic discs. At that time I had never seen anything quite like it except once, in a young man who was the subject of acquired syphilis, and who was suffering from an attack of recent hemiplegia, probably the result of syphilitic thrombosis. I have since seen one case identical in appearance in a child, the subject of congenital syphilis with nervous symptoms, and in whom I have traced some of the spots on to the atrophied condition with which one is familiar in choroiditis disseminata. It cannot be too strongly stated that the ophthalmoscopic appearances in E. W. were as different as possible from the milk-white, round, larger defined spots which are recognised as tubercle of the choroid."

The child died within a month from the above examination, and I made sections of the choroid in the yellow spot region where the above spots of disease had been chiefly seen, and where they were visible after removal of the retina as minute round whitish dots, and also of the disc and neighbouring retina.

The following description was given together with the accompanying woodcut (Fig. 2), which I am allowed to reproduce:—"The changes in the choroid consist in the presence of small collections of corpuscles in the chorio-capillaris. Sections of several of these were found in the part of the choroid which had shown during life little flecks of exudation, and none were found elsewhere.

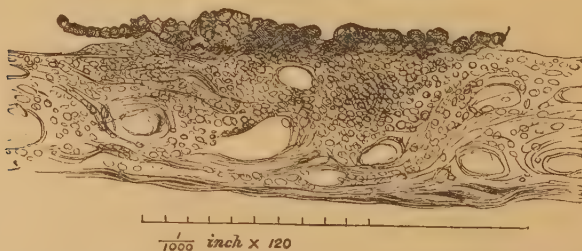


FIG. 2.—Small gumma in capillary layer of choroid (from Dr. Barlow's case, *Path. Soc. Trans.*, xxviii, 287).

"The corpuscles are about as large as pus corpuscles and stain deeply with logwood. They stand in no evident relation to the blood-vessels, and none of them occur in the deeper part of the choroid. In all these particulars they differ from tubercle.

"The elastic lamina over these deposits is slightly raised, and sometimes a little puckered. In several instances at the seat of the deposits a thin layer of flattish cells is present on its inner (retinal) surface, immediately beneath the pigment epithelium, but in no sections could any perforation of the lamina be detected. The epithelium itself appears morbidly adherent."

The choroidal changes are better shown in the new woodcut (Fig. 3), which I now add.

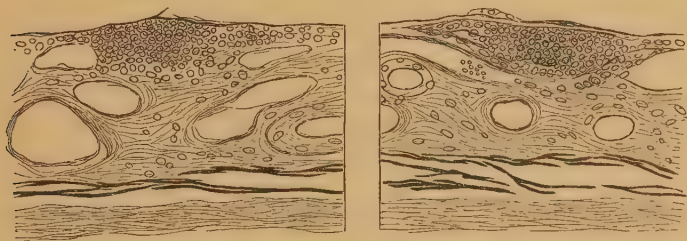


FIG. 3.—Two other minute gummata in the capillary layer of the choroid from the same eye as Fig. 2. Pigment epithelium lost; flat cells lying on elastic lamina in one specimen, elastic lamina split or frayed out over the growth in other specimen. $\times 120$.

Dr. Ole Bull,* in commenting on this case, observes that the state of the retina was not described. I have no sections of the retina except near to the disc. The disc itself is slightly swollen, but the swelling extends only a very short distance into the retina. The physiological pit is filled up by an irregular collection of small lymphoid cells, which spread in the form of a thin layer, a little way on each side; there is also a great excess of nuclei in the disc itself, as far down as the level of the lamina cribrosa; but further back, although the arachnoid sheath is thickened, the nerve itself seems tolerably healthy (the sections extend one-eighth of an inch beyond the eyeball). Many of the arteries in and close to the disc show

* Bull, *loc. cit.*, p. 91.

very thick coats. It is particularly to be noted that there were no spots of choroiditis near the disc in any of the sections.

In this case it can hardly be doubted that the changes in the choroid were co-incident with, or at least not subsequent to, those in the disc and adjacent retina; for the cells in all parts had the same characters, no signs either of degeneration or atrophy were present, and the child was too young for the morbid changes in different parts to have been separated by any long interval of time.

CASE 7 has been previously published in these Reports, vol. vii, p. 374 (Register No. 78). The eye, which was excised from a woman aged 25, had begun to atrophy, and the retina was detached and shrunken; the eye had been inflamed for a year and a half during secondary syphilis. A re-examination of the sections of choroid, which have kept well for fourteen years, shows alterations like those in the other cases, but, as might be expected, with commencing atrophy. Collections of small cells, sometimes circumscribed, in other parts more widely spread, are present in the chorio-capillaris. The elastic lamina is thickened and sometimes wrinkled, and numerous small "colloid" growths project from its retinal surface. In some places the thickness of the whole choroid is a good deal reduced, and here, as a rule, there are no collections of corpuscles. Dr. H. Pagenstecher made drawings from other sections of this choroid, and I believe that figs. 1, 2, and 3 in Plate XIV of his Atlas are taken from them, although Dr. Pagenstecher's description of the eye from which these drawings were made does not quite tally with the case as published by myself.



$\frac{1}{10}$ mm $\times 70$

Syphilitic Choroido-Retinitis.

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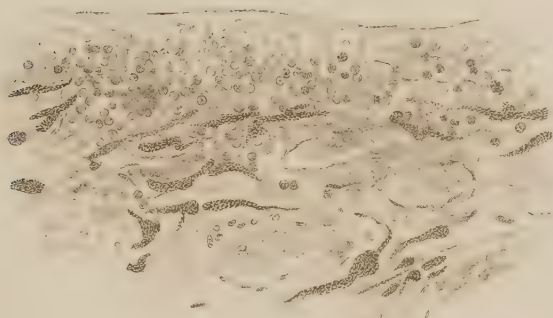
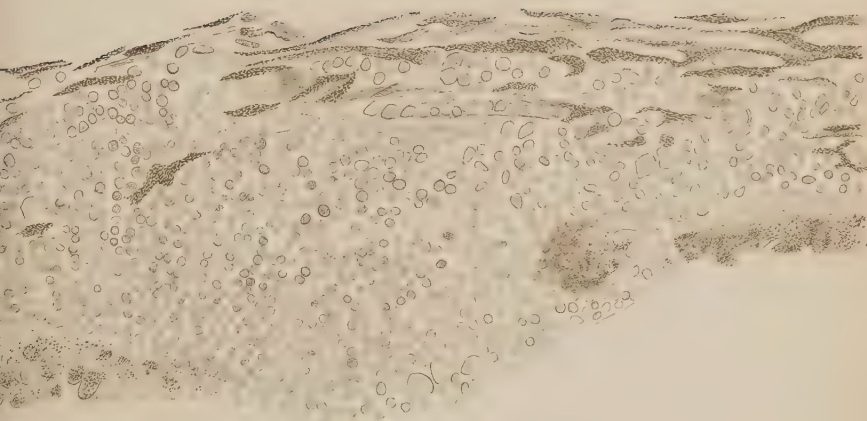
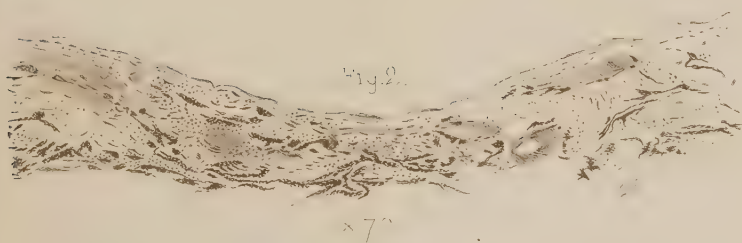
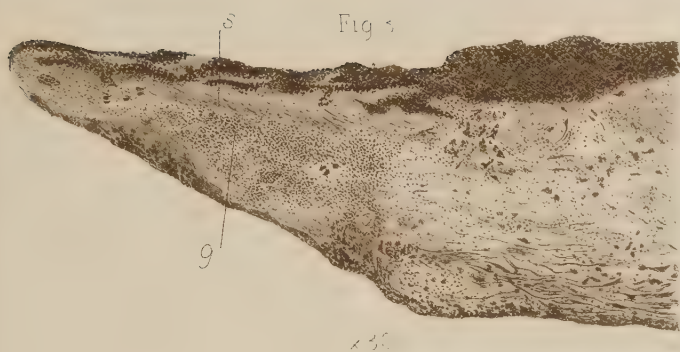


Fig. 5



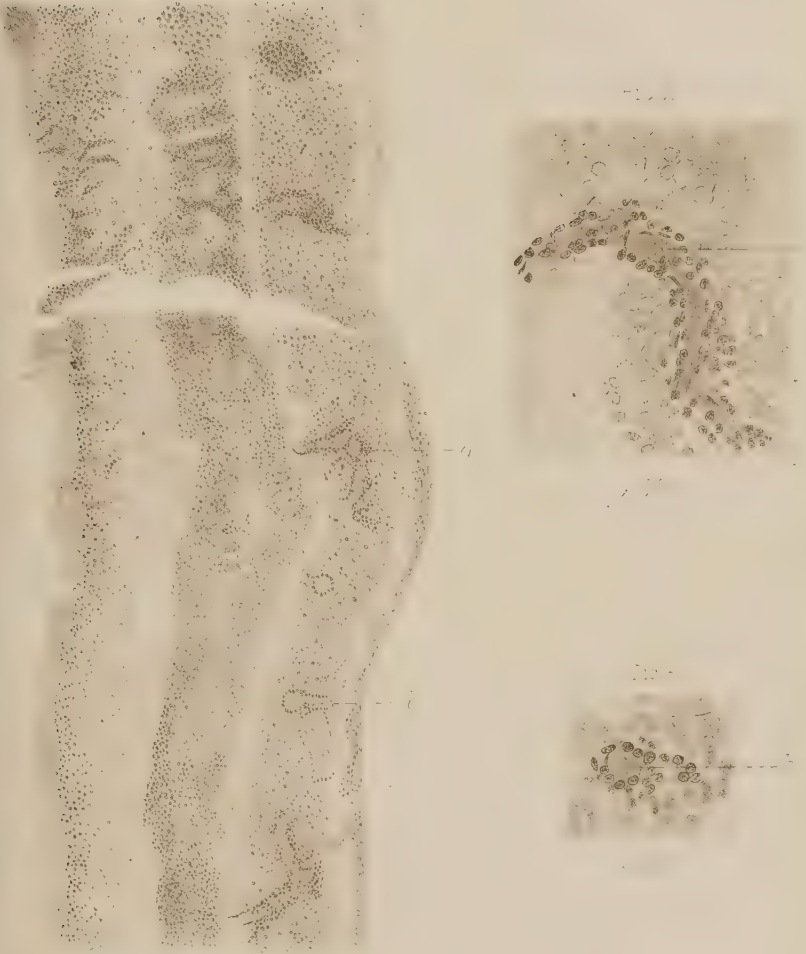
— 1 —

Fig. 5. — 1 —



Syphilitic Cornea, etc.

Fig 1.



Syphilitic Retinitis

DESCRIPTION OF PLATES I, II, III, AND IV, ILLUSTRATING MR. NETTLESHIP'S
PAPER ON SYPHILITIC CHOROIDITIS AND RETINITIS.

Plate I shows, under a low power, the appearances of a vertical section through a patch of severe choroido-retinitis, with inflammatory adhesions between choroid and retina. There is great thickening of the coats of a large retinal artery seen in section at the lower part of the figure. In Case 4. $\times 70$.

Plate II, figs. 1 and 2 show collections of small round cells in the capillary layer of the choroid (microscopic gummata), from the same eye as Plate I.

In Fig. 1 the elastic lamina of the choroid passes intact over the seat of the cell-exudation; the pigmented epithelium has been washed off. (From a section mounted in Dammar.) $\times 220$.

Fig. 2 shows a larger collection of cells, many of which have passed through the elastic lamina causing disturbance, and even complete disappearance, of the pigmented epithelium. The elastic lamina appears to be almost destroyed at this part. (From a section mounted in Glycerine.) $\times 220$.

Plate III, figs. 1 and 2 are from the same eye as Plates I and II.

Fig. 1.—Section of a rather larger gumma occupying the middle and innermost layers of the choroid; centre beginning to degenerate; pigmented epithelium unaltered. $\times 70$.

Fig. 2.—Section through a small patch of partially atrophied choroid. A slight excess of nuclei is noticeable in the atrophic part. Pigmented epithelium was probably disturbed or partly absorbed, but its remains have been washed off in the process of mounting. $\times 70$.

Fig. 3.—From a vertical radial section of the iris at its pupillary border. Uveal surface uppermost. *s*, fibres of sphincter muscle cut rather obliquely. *g*, effusion of small cells between the sphincter and the anterior surface. If larger, this cell-mass would form a "nodule" or "gumma" on the iris. From Case 3. $\times 30$.

Plate IV shows the changes in the Retina in Case 3.

Fig. 1 shows general thickening of retina with increase of nuclei, and œdema. The cell increase is however most marked in the nerve-fibre layer and inner granular layer. The hyaloid membrane also shows increase of nuclei.

The coats of all the small blood-vessels are crowded with nuclei, which are smaller but more deeply stained than the surrounding nuclei.

Figs. 2 and 3 show, under a power of 220 diameters, the vessels *a* and *b* which are displayed under a lower power (70 diameters) in Fig. 1.

THE MORE MODERN OPERATIONS FOR TRICHIASIS.

By ARTHUR H. BENSON, F.R.C.S.I.,

Ophthalmic Surgeon to City of Dublin Hospital, Assistant Surgeon to Saint Mark's Ophthalmic Hospital.

OPERATIONS for the cure of Trichiasis are as the stars of heaven for multitude; but I shall confine my remarks to three of the more modern and most generally applicable.

Cases of Trichiasis, with or without Entropium, have until lately been amongst the most hopeless, regarded from a surgical point of view. In most instances the older operations aimed at either removing the offending hairs, and with them a larger or smaller amount of the lid substance, or effecting the alteration in the direction of the cilia by everting the lid border. They were for the most part associated with shortening of the lids, and almost certainly permitted a recurrence, except in the radical but barbarous operation of abscission of the lid border. Since Mr. Spencer Watson gave birth to the idea of preserving and transplanting the strip of skin, thrown away in Arlt-Jäsche's operation, every modification has been in the conservative direction, and has produced more satisfactory results.

Those who wish to obtain a full and historical *résumé* of the subject can do so by consulting the admirable paper written by my friend and colleague, Dr. Story, in the "Ophthalmic Review," vol. ii, p. 37.

Partial Trichiasis has long troubled ophthalmologists, especially that form of it so often met with, where, without Entropium, one, two, three, or more cilia are growing in a faulty direction, rubbing on the cornea, and causing the utmost annoyance.

At the meeting of the British Medical Association, held in August and September, 1882, I read a paper on the use of

Electrolysis in this form of the affection.* As I have since then largely increased my experience of the method, which was at that time quite a new one, I may be forgiven for recapitulating some of the statements I then made in ignorance of the fact that Dr. Michell, of Missouri, had been working in the same direction and with similar results.†

The operation is done with a constant current battery: I use ten small Leclanché's cells. A fine electrolysis needle is attached to the *negative* pole, and a large pad to the positive pole. The needle is then passed along the hair to be destroyed until its point reaches quite up to the extremity of the bulb; contact is then made and the circuit completed by applying the pad to the temple or brow. The electrolytic action of the current decomposing the watery elements of the tissues produces a bubbling of hydrogen gas around the needle, and a slough forms in a few seconds. When the ring formed around the cilium and needle is of sufficient size to insure the destruction of the bulb, that is, in about 20 seconds, if the battery is working well, the needle is removed, and the hair caught in a pair of forceps and drawn out, or wiped away with the slough. If the hair does not easily and without the least drag come out and bring with it a mass of greyish, gelatinous slough, it is better to reapply the needle, as unless the bulb is fully destroyed, the hair may grow again.

Each hair must be so treated, unless two or more grow so closely together that they can be simultaneously destroyed, but it is better not to make the slough larger than necessary, and therefore it is preferable to attack each hair separately.

The operation is very painful, but the pain ceases at once on removal of the needle, and no inflammatory reaction or subsequent contraction follows.‡

* Brit. Med. Journ., 16th Dec., 1882. † Klin. Monatsbl., April, 1882.

‡ The use of an anæsthetic, though not in most cases necessary, will be found to simplify the operation very much.

I have now performed this operation on many hundreds of cilia, and have every reason to be pleased with the results.

The advantages of this mode of treatment are so obvious that it seems hardly necessary to state them, but as many of the text-books still continue to recommend epilation, actual or potential cautery, and excision, it seems that the method is either unknown or unappreciated as it deserves. By this method you—

(1.) Can destroy with certainty, and without disfigurement of the lid, any number of individual aberrant cilia, no matter how attenuated or how short they may be.

(2.) There is no need for hurry in applying the needle, but the hair to be treated may be selected and the needle inserted with the utmost deliberation, as no action takes place until the second pole is placed in contact with the skin. (How different when using the actual cautery.)

(3.) The effect can be gauged with perfect accuracy, for if, after removing the needle, it be found on trial that the cilium is still firm, the needle can be again applied, and so on until the required effect has been produced. Practically, however, this is seldom necessary, for a little experience enables the surgeon to judge by the appearance of the slough how soon to remove the needle. (How different again is this from the cauteries: where once applied their action is almost beyond control, and if the actual cautery be used the external portion of the hair is burned so that the guide is lost.)

Epilation and *Illaqueatio* are the only operations which can in any way compare with electrolysis. The former is, however, only palliative, and by the irritation of its frequent repetition may often cause the growth of fresh hairs without destroying those removed. From its simplicity, however, it will always be practised in certain cases.

Illaqueatio from its antiquity is worthy of all respect, but, setting aside the fact of its being only applicable to

those cases where the cilia are long and strong, I have every reason to believe that in few instances are its results permanent, and I see no advantage which it possesses over electrolysis, for the advantage of preserving abnormal cilia is purely theoretical, and not sound even from that aspect. The cilia which cause trouble in Trichiasis are not, as some writers seem to think, the normal hairs in an abnormal position, but in a very large majority of cases they are new-born hairs produced by reason of the hyperæmic condition of the original bulbs. The increased nutrition causes the hair-follicle to send off buds which develop fresh hairs, and it is these that are the source of annoyance. The original rows of cilia retain their normal and innocuous position: why then is it better to snare these errant hairs and try to make them grow out through the skin (an entirely abnormal position) rather than destroy them entirely? Clearly it is not better.

For cases of *extensive Trichiasis*, with or without Entropium, Dianoux's operation was, until lately, the most satisfactory of the modifications suggested by Spencer Watson's method. It consists in splitting the lid, as in Arlt-Jäsche's operation, then making two incisions in the skin of the lid parallel to the lid border, the one nearest the cilia being made sufficiently deep to join the intermarginal incision, the second only extending through the skin of the lid. The upper (skin) flap is then drawn down underneath the ciliary flap and made fast with a suture at each end, whilst the ciliary flap is stitched up in the position vacated by the skin-flap. The effect is that the cilia are elevated by as much as the breadth of the flap, and receive a firm and permanent support from below by reason of the transplanted skin. This operation I performed in a large number of cases, sometimes with the most satisfactory results; at other times without material benefit to the patient, although, surgically considered, the operations were entirely successful. The reason of this difference was not far to seek.

When the hairs rubbed on the cornea because the lids were inverted, and where the cilia were growing in their normal position relatively to the lid border, then the double transplantation operation gave good results, for in this case the transplanted skin flap and the cicatrices were all on the free border of the lid, and did not rub on the cornea. But where, owing to the existence of true Trichiasis, the abnormally situated cilia grew so close to the conjunctival border of the lid that, in order to ensure having them all in the anterior plate, the intermarginal incision had to be made very close to or in the conjunctiva, then the skin flap had to be transplanted into a situation where contact with the cornea was inevitable, and consequently irritation, due to the presence of the downy hairs of the skin, was also inevitable. Thus the operation, though affording considerable relief, did not satisfy the requirements.

I may here mention that my observations of the behaviour of the skin flap transplanted to the conjunctival border of the lid, are at variance with those of most other writers. They state that no irritation is produced by the skin rubbing on the cornea, and affirm that in a very few weeks it is difficult to distinguish the flap from the mucous membrane beside it. I have under observation still several cases operated upon from one to two years ago, and in all it is still quite easy to see the limits of the skin flap, more especially as the epithelium continues to form in white, easily removed masses, and there seems to be no appreciable change in the appearances for many months.

Again, Mr. Swanzy in his *Handbook of Diseases of the Eye*, p. 141, says: "The wounded surface of the ciliary flap amalgamates with the epidermic surface of the skin flap so completely, that in the course of a short time it is impossible to separate them, and ultimately nearly all traces of the operation disappear." In my experience this union never takes place. I have always, even after an interval in some cases of two years, been able to pass a fine probe through the lid from skin surface to lid

border. This, however, produces no deformity of the lid and the cosmetic result of the operation is most excellent.

In view of the imperfections of Dianoux's method, Van Millingen, of Constantinople, suggested the transplantation of a strip of mucous membrane taken from the inside of the lip. Van Millingen in his earlier operations used conjunctiva from the rabbit. Subsequently both he and Mr. Story, of Dublin, quite independently of one another, adopted the plan of taking mucous membrane from the lip.

The *method of performing this operation*, which I have found most useful, is as follows.

The lid border is split as in all this class of operations, care being taken that all the cilia are in the anterior plate, and that the section is made to extend well up to the roots of the cilia, or above them. The clamp is then removed from the eyelid, and the bleeding allowed to stop, whilst the same clamp, or by preference a larger one, is applied to the everted lower lip of the patient and screwed down.

Two parallel incisions of the required length are then made through the mucous membrane about 3 or 4 mm. apart, and the flap dissected up. This is best done by passing a strabismus hook under the flap at one end and dissecting up towards the centre, then doing the same at the other end; by this means the flap is not bruised, as the use of forceps is entirely avoided; it is more easily dissected, being left attached to the lip at both ends and in the middle, and its nutrient supply is only cut off for the minimum time.* The central adhesion being divided, a threaded needle is passed through one end of the flap (still adherent to the lip at both ends), and inserted into

* A method of dissecting the flap which I have found very useful is that by multiple transfixion. It is done by passing a curved broad needle under the flap in a number of places, so as, to a large extent, to separate the mucous from the sub-mucous tissue of the lip, then through one of these transfixion holes introduce the strabismus hook and divide the intervening bridges of tissue as above.

the angle of the gaping intermarginal cut. A second needle is passed through the other end of the flap and through the corresponding end of the lid wound. One end of the flap is then divided with scissors, and, holding the flap on the stretch by the suture passed through it, all fat and sub-mucous tissue is carefully removed with curved scissors. This is an important step of the operation. The other end of the flap is then divided with scissors, and the band of mucous membrane is lifted up to position in the lid, and the sutures made fast. A central suture is then inserted, iodoform ointment on lint is applied over the lid, and a pad of wool and a bandage complete the operation. No sutures or dressings are applied to the lip, which heals with great rapidity.

The operation is necessarily a tedious one, but not more so than Dianoux's, nor is it more difficult. At first considerable annoyance was experienced from the bleeding of the lip when held everted by an assistant; the clamp, however, obviates that, and moreover saves the assistant from a most tiresome job, as will readily be granted by any one who has tried to keep a slimy lower lip everted and on the stretch during the slow dissection of the flap. Moreover, the assistant's two hands are much more in the way of the operator than the clamp is.

The depth of the intermarginal incision is a matter of great importance. It should be deep enough to permit the strip of mucous membrane, when transplanted, to lie smoothly, and in complete contact, on the raw surfaces; not as forming the base of a triangle whose apex is at the superior angle of the wound (in upper lid).

The introduction of the sutures whilst the flap is *in situ* is, I think, an advantage in that it saves much of that dragging which often injures the vitality of flaps, and it shortens the time of total separation. I have usually found a curved broad needle the most convenient instrument with which to complete the dissection of the flap.

This operation, or something like it, I have performed

about 15 or 20 times, and assisted at as many more. I have done it with the most satisfactory results on both upper and lower lids, and without a single total failure. Usually the whole flap lives, at times a small portion sloughs, but when it does I generally find that it was too long for its bed, or was in some way thrown out of position.

In the first case on which I operated, I cut the flap too long, allowing too much for shrinkage; in this case the flap lived at each suture, but sloughed between them, pointing to the fact that close application is essential.

The surgical results, then, of this operation are quite as good as those of Dianoux's, and the advantages of transplanting mucous membrane instead of skin, to the lid border or conjunctiva, are so obvious that even if it were far less of a success surgically, it would still be preferable to any other operation that has as yet been suggested for the cure of extensive Trichiasis.

It is too short a time (only a few months) since the operations have been done to judge of their ultimate results, but so far the effects have been uniformly excellent.

CURATOR'S PATHOLOGICAL REPORT.

By W. J. MILLES, F.R.C.S.,

*Late Curator of the Hospital Museum.*PART I.—*Detachment of the Vitreous Body.*

IN the subjoined table will be found a short report of 43 cases of detachment of the Vitreous Body from the Retina. These cases occurred out of a series of 345 eyes removed at Moorfields Hospital. In every instance the retina and choroid were in their normal position, or only very slightly detached. I have excluded all those forms of wide detachment of the Retina, with shrinking of the vitreous, and limited myself solely to separation of the vitreous body from the retina.

Detachment of the vitreous body may be roughly divided into two forms, the *infundibular*, and the *globular*; the latter, I believe, being a late stage of the former.

The *infundibular*, in my experience, is the more common form, and commences by a separation of the vitreous body from the retina, usually in the equator of the globe or just behind the equator. As the vitreous shrinks, the separation becomes wider, till the outline resembles that of an umbrella detachment of the retina: the vitreous remains adherent at the papilla by a more or less delicate attachment. This attachment is sometimes so fine, that it breaks away at the slightest touch; sometimes it is very firm and fibrous, a solid cicatricial cord filling up and completely obscuring the optic disc. The vitreous is again firmly fixed to the ora serrata and pars ciliaris retinæ; it is usually closely in contact with the posterior surface of the lens, and I have been unable to detect the wide separation in this position described by some authors.

In one or two instances the vitreous was fluid in the centre, and so consisted simply of a funnel-shaped mass, which was excessively tough and firm.

A few of my cases indicate a stage prior to the infundibular detachment: there is a fairly broad basis of attachment behind reaching a few millimetres on all sides of the papilla.

The *globular* form of detachment has no attachment behind, and is evidently a late stage of the infundibular; for on careful examination I usually found a small tag hanging from the posterior part of the vitreous. The infundibular can frequently be made into a globular detachment by simply detaching the vitreous at the papilla.

The *hyaloid membrane* in some cases is separated with the vitreous from the retina, though in the majority it remains with the latter. However, when it does remain with the retina, it can be separated from it with the greatest ease by a pair of forceps. Now and then I have noticed, when the vitreous has been widely separated, that the hyaloid membrane has been floating loose in the fluid between the vitreous and the retina. I think it is certain that the membrane which is called the hyaloid is part of the vitreous, for from a pathological point of view it seems always to be affected when the vitreous is diseased: notably in cases of fluid vitreous, the hyaloid membrane is almost always separated from the retina. Comparative anatomy shows that it is developed with the vitreous, for it passes over the Pecten in birds, a position where there is no retina.

I have grouped the cases as follows:—

	No.
Table I. { Penetrating wounds.....	15
{ Blows.....	5
II. { Ulcers perforating	2
{ „ non-perforating.....	5
III. Glaucoma	8
IV. Sympathetic ophthalmitis	3
V. Extraction of cataract	3
Needling operations	1
VI. Recurrent iritis.....	1
	—
Total.....	43

It is noticeable in Table I. that the tension of the eyes at the date of excision was with one exception diminished; also that in all the 20 cases in this table there was suppurative hyalitis more or less advanced. From the history of these cases, and from the extent of the external wound of the eyes, it is probable that in nearly one half of them there was more or less loss of vitreous at the time of the accident; so that they do not bear so much on idiopathic detachment of the vitreous.

In Table II. the tension was normal in 3 cases, sub-normal in 2; there was suppurative hyalitis in 3 instances.

In the group of Glaucoma cases, the tension was invariably increased at the time of excision. Suppurative hyalitis was present twice.

In Table IV. 2 eyes were exciting, 1 sympathising, tension being increased in 2, and diminished in 1.

In the eyes excised after extraction of cataract the tension was increased in 1, and diminished in 2; suppurative hyalitis was present in the latter.

Microscopic examination of the vitreous showed in most instances a large increase of cells. Of course this was to be expected in the forms of suppurative hyalitis. Here there was proliferation of the normal vitreous cells, seen chiefly in the centre, with a large number of smaller migrated inflammatory cells in the periphery, chiefly in the region of the ciliary body. In one case, the pus cells (at some distance from the margin of the vitreous) contained pigment granules evidently taken up from the broken up pigmentary layer of the pars ciliaris retinae. In one case of great fibroid thickening of the vitreous, there were a large number of vitreous cells of various shape and size. No detailed microscopic examination of the eyes is given in the tables, as it would be rather beyond the scope of this paper.

The method I have employed in examining these eyes, was the ordinary one of leaving them for a period varying between one month and six weeks in Müller's fluid, then

opening them in an antero-posterior direction after they were frozen, making the section just to one side of the papilla. A careful note was then taken of the position and size of the vitreous, as the specimen lay in water. It might be objected that the Müller's fluid may have produced some shrinkage of the vitreous body during the process of hardening. That no alteration whatever occurs I feel almost sure: for I have found that no diminution in the size of the vitreous happens in healthy eyes as well as in a large majority of diseased ones, otherwise all eyes examined by this method would have detached vitreous. To make assurance doubly sure, a certain percentage were examined in the fresh state, among which were some few cases of detachment. The examination in a fresh state is however rather unsatisfactory, as the parts are so liable to become collapsed.

The practical conclusion to be drawn from these cases is, that if there is diminished tension in an eye with a punctured wound there is every probability that the vitreous is suppurating and detached, other signs of inflammation, &c., being present.

Reduced tension, however, does not necessarily mean detached and shrinking vitreous, nor on the other hand does increased tension exclude it, for in eight cases of glaucoma, with increased tension at the time of excision, a detached vitreous was found.

DETACHMENT OF THE VITREOUS BODY.

TABLE I.—*Eyes Lost by Injury.*

Sex, age, and register No.	Nature of accident, with account of chief pathological changes in excised eye.	Interval between injury and excision.	Tension at date of excision.	Pathological changes in vitreous body.
Female, æt. 58. No. 1043.	Blow on right eye with a piece of wood : lacerated wound of cornea : part of iris torn away ; lens <i>in situ</i> .	5 weeks.	T 1.	Infundibular detachment well marked : streaks of lymph passing backwards from lowest part of ciliary body.
Female, æt. 9. No. 1046.	Punctured wound of left cornea, iris, and lens. Puckering of cornea : iris inflamed : puncture passes through lens and into the vitreous : lens greater part absorbed.	6 weeks.	— T 1.	Infundibular detachment not so extensive as last case ; its posterior surface is streaked with blood. <i>Suppurative Hyalitis</i> .
Male, æt. 18. No. 1055.	Blow on right eye 7 years ago. Iridectomy performed then : pain last 2 months. Anterior synchiae : absorption of lens : nodule of lymph on ciliary processes. Retina and choroid <i>in situ</i> . Papilla swollen with a tag of lymph attached to it.	7 years.	T.n.	Globular detachment evidently infundibular at one time from tag of lymph attached to papilla. Numerous small punctate foci of inflammation scattered all over vitreous.
Male, æt. 40. No. 1060.	Left eye struck by piece of steel. Electro-magnet used. Wound of entrance in cornea, wound of exit close to papilla : iris adherent at corneal wound : lens absorbed.	1 month.	— T 1.	Vitreous attached behind at wound of exit ; semifluid, suppurating : is shrunken to less than half its normal size.

Male, æt. 36. No. 1064.	Wound of right cornea, iris, and lens, with large fragment of iron; iris adherent to scar along its whole length; greater part of lens absorbed, small round cells within crumpled capsule; a linear detachment of retina running from below upwards to wound in cornea, patches of exudation in retina: well-marked papillitis.	6 weeks.	-T.	Infundibular detachment: the attachment to the papilla is by a very fine cord which widens out somewhat at the papilla. The vitreous is shrunken to a small opaque mass close behind the iris, is dotted over with punctate patches of supuration. Some of these patches seem to be due to proliferation of the normal vitreous cells: others contain small round cells.
Male, æt. 35. No. 1080.	Injury by explosion of dynamite followed by (?) facial Erysipelas: kerato-iritis and hypopyon. Deep anterior chamber, absorption of lens: retina and choroid <i>in situ</i> .	10 weeks.	-T 1.	Infundibular detachment: streaks of lymph pass backwards from the pupil. Vitreous of normal consistence, and about half the normal size.
Male, æt. 54. No. 1085.	Blow with piece of wood; suppurative keratitis; severe iritis; lens cataractous: several small detachments of the retina.	14 weeks.	-T.	Infundibular detachment: similar to No. 1064. The greater part of the vitreous is, however, clear; but at one point there is a patch of semi-solid pus close to the ciliary processes.
Male, æt. 45. No. 1096.	Wound of globe by piece of steel: track of wound passes from edge of cornea to close to the optic nerve: piece of steel embedded here in sclerotic: anterior chamber very deep: several large detachments of retina.	8 years.	-T.	The foreign body passed through the vitreous; a firm solid cord passes from wound of entrance to wound of exit. Vitreous detached behind, and has undergone a fibroid change.
Female, æt. 12. No. 1125.	Large transverse wound of left cornea; lens absent: prolapse of iris. Suppurative cyclitis and retinitis.	6 days.	-T 1.	Globular detachment. Suppurative hyalitis. There had probably been some loss of vitreous at the time of the accident.

TABLE I.—*continued.*

Sex, age, and register No.	Nature of accident, with account of chief pathological changes in excised eye.	Interval between injury and excision.	Tension at date of excision.	Pathological changes in vitreous body.
Male, æt. 56. No. 1139.	Wound of right cornea and lens by a chip of steel. Electro-magnet introduced through wound, and foreign body removed. Lens extracted, formation of hypopyon: shallow anterior chamber: slight detachment of retina and choroid below.	3 weeks.	—T.	Infundibular detachment: the exterior attachment is 3 mm. behind ora serrata: commencing suppurative hyalitis.
Male, æt. 13. No. 1152.	Blow on right eye. Traumatic cataract: hypopyon: great swelling of iris: absorption of lens.	5 weeks.	—T.	Slight detachment around papilla. Commencing suppurative hyalitis. Streaks of pus spreading backwards from ciliary processes; anterior half of vitreous opaque; posterior half clear, and of normal consistence.
Male, æt. 40. No. 1174.	Blow on right eye. Traumatic keratitis: dense leucoma of cornea: anterior and posterior synchiae: purulent cyclitis below.	6 years.	—T 2.	Infundibular detachment: solid localised mass of pus below over ciliary body: remainder of vitreous clear.
Male, æt. 21. No. 1178.	Right eye wounded just behind the ciliary region by a piece of steel: slight cyclitis. Retina, choroid, and vitreous adherent at scar.	1 month.	—T 1.	Slight infundibular detachment: a good deal of blood in vitreous close to the scar.

Male, æt. 10. No. 1181.	Punctured wound of left cornea, iris, and lens, by a knife. Wound reaches into upper ciliary region: iris adherent to wound: lens cataractous throughout, and partially absorbed: pus-cells spreading into it.	5 weeks.	T.n.	Commencing suppurative hyalitis. Vitreous detached behind but adherent at one spot internal to the papilla: evidently the track of the punctured wound.
Male, æt. 8. No. 1203.	Lacerated wound of right cornea and iris by a piece of slate. Lens absent, probably evacuated at time of accident: iris entangled in whole length of scar. Atrophic patch at macula: retina and choroid adherent together here.	3 weeks.	T.n.	Globular detachment. Vitreous occupies about half its usual space; is clear and of normal consistence: probably the detachment is due to loss of vitreous at time of accident.
Female, æt. 14. No. 1215.	Wound of left cornea, iris, and lens, by prong of a fork: anterior synechia to wound: lens greater part absorbed: retina and choroid <i>in situ</i> .	4 months.	—T.	Globular detachment evidently infundibular at a recent date from the tags attached to papilla and posterior surface of vitreous. Hyaloid membrane remaining with retina, but separating from it with great ease.
Male, æt. 10. No. 1230.	Wound of right cornea, iris, and lens: anterior synechia to scar: lens flattened and cataractous: retina detached slightly in one or two places.	1 month.	—T.	Globular detachment: suppurative hyalitis chiefly of anterior part, evidently starting from ciliary body.
Male, æt. 21. No. 1275.	Wound of right cornea and lens: anterior synechia to wound: deep anterior chamber: lens being absorbed: retina large, irregular detachment.	3 weeks.	T.	Globular detachment: commencing suppurative hyalitis.
Male, æt. 29. No. 1305.	Injury of left eye by gun-cap: recently great pain in eye: a solid mass of lymph above obscuring ciliary body: latter enlarged here: retina and choroid <i>in situ</i> .	14 years.	—T.1.	Infundibular detachment: very fine cord at papilla: centre of vitreous fluid.

TABLE I.—*continued.*

Sex, age, and register No.	Nature of accident, with account of chief pathological changes in excised eye.	Interval between injury and excision.	Tension at date of excision.	Pathological changes in vitreous body.
Male, æt. 12. No. 1345.	Wound of cornea by pair of scissors: anterior and posterior synechia to wound: cicatrix in retina and choroid external to papilla.	11 years.	T.n.	Vitreous detached behind, adherent at posterior cicatrix in retina and choroid: of normal consistence, with fibrous bands running through it.

TABLE II.—*Ulcers of Cornea—Perforating and Non-perforating.*

Sex, age, and register No.	Nature of accident, with account of chief pathological changes in excised eye.	Interval between injury and excision.	Tension at date of excision.	Pathological changes in vitreous body.
Male, æt. 63. No. 1089.	Right eye lost from old ulceration of the cornea: pain during last 3 or 4 weeks. Ciliary staphyloma, leucomatous cornea, with iris adherent to its posterior surface: lens close behind cornea: ciliary processes atrophied slightly: retina and choroid <i>in situ</i> : slight papillitis.	25 years.	T.n.	Globular detachment: vitreous occupying one-third of its usual space: it is clear and of normal consistence.
Female, æt. 13. No. 1146.	Purulent ophthalmia, perforating ulcer of cornea below, with prolapse of iris. Lower half of cornea flattened, thin, with iris firmly adherent to it: lens cataractous, lower part tilted forward to ulcer: retina detached in front of equator above: choroid <i>in situ</i> : the ciliary body is smaller and partially obscured by the opaque vitreous.	2 months.	—T.	Commencing infundibular detachment: the vitreous not being detached so much anteriorly: here, however, it has dragged on the retina and produced detachments of the latter: there is suppurative hyalitis in an early stage.

Male, æst. 4. No. 1182.	Ulcer of left cornea, resulting in staphyloma: cornea irregularly thickened: iris wholly adherent to cornea: lens cataractous and close to retina and choroid <i>in situ</i> .	2 years.	T. not noted.	Infundibular detachment: clear, below normal consistence.
Female, æst. 4. No. 1189.	Ophthalmia neonatorum resulting in a large prominent staphyloma of left cornea: the latter greatly thickened, iris frayed out and adherent to cornea: lens absorbed: choroid and retina <i>in situ</i> .	4 years.	- T 2.	Early stage of infundibular detachment: vitreous adherent at papilla, but detached all round as far as equator of globe: slow form of suppurative hyalitis: hyaloid membrane separates from retina with ease.
Female, æst. 24. No. 1238.	Gonorrhœal ophthalmia of left eye: perforation and flattening of cornea: iris swollen and covered by a thick layer of granulation tissue: lens absorbed: retina and choroid <i>in situ</i> : ciliary body enlarged.	7 weeks.	- T 1.	Infundibular detachment. Some fine streaks of pus pass backwards from the pupil nearly to the papilla: vitreous otherwise clear.
Female, æst. 54. No. 1295.	Right eye excised for a large infiltrated ulcer of the greater part of the cornea: the latter is very thin, but is not perforated: the anterior chamber is filled with pus: the lens is <i>in situ</i> , also the choroid and retina: there is some papillitis.	1 month.	T.n.	Early stage of infundibular detachment. Vitreous clear and of normal consistence.
Male, æst. 63. No. 1166.	Large superficial ulcer of cornea: latter deeply infiltrated with pus, and very thin: a large mass of pus in lower part of anterior chamber: pupil blocked with lymph: iris firmly adherent to anterior capsule of lens: retina and choroid <i>in situ</i> . Paracentesis of the cornea had been performed several times for evacuation of the pus: the latter, however, quickly reformed. Tension had been increased for some time previous to excision.	7 weeks.	T.n.	The vitreous is detached in an irregular manner behind: the posterior half has apparently become fluid: the hyaloid membrane is rather thicker than normal; is in contact with, but not adherent to, the retina.

TABLE III.—*Glaucoma*.

Sex, age, and register No.	Nature of accident, with account of chief pathological changes in excised eye.	Interval between injury and excision.	Tension at date of excision.	Pathological changes in vitreous body.
Male, æt. 43. No. 1104.	Subacute glaucoma in left eye: great pain for a fortnight before excision: no absolute glaucoma. Retina slightly detached above: lens opaque. Deep glaucomatous cup. The right eye is suffering from subacute Glaucoma with restricted field. Sluggish pupil, &c.	7 years.	T 3.	Slight detachment of vitreous all round the papilla: it is clear and of normal consistence.
Female, æt. 64.	Subacute Glaucoma. Sclerotomy performed upwards. A large bulging scar along whole length of sclerotomy incision, with prolapse of iris: lens pushed forwards. Retina swollen and inflamed, especially about papilla, which is obscured.	11 months.	T 1.	Globular detachment. Vitreous considerably shrunken.
Female, No. 1135.	Subacute Glaucoma of left eye, coming on very slowly: pain only during last month. Several large staphylomata of sclerotic at equator: dilated pupil, shallow anterior chamber: retina swollen, especially at papilla, detached in a ridge shape from before backwards.	16 years.	T 1.	Vitreous shows an early form of infundibular detachment. It is adherent all round the papilla, and as far as the macula; it is again adherent anteriorly at 5 mm. from the iritic angle. The canal of Cloquet is well seen.

Male, æd. 67. No. 1138.	Absolute Glaucoma of left eye: 2 months ago the right eye beginning to fail from Subacute Glaucoma, the patient noticed for the first time that the left eye was quite blind. Left eye at date of excision has no p.l., the cornea is hazy, margins vascular. Hypopyon, iris atrophied; some posterior synechia, O.D. only slightly cupped; choroid and retina <i>in situ</i> .	?	T 2.	Vitreous slightly detached from retina above: is fluid in centre; some opaque strings pass backwards from the ciliary body into its substance: the hyaloid membrane is separated from the retina in several places, and detached with the vitreous.
Male, æd. 66. No. 1160.	Absolute Glaucoma with secondary cataract: anterior chamber of fair depth: iris very markedly adherent to cornea at angle of anterior chamber: retina and choroid <i>in situ</i> : O.D. cupped.	18 months.	T 1.	Vitreous is clear, solid consistence, is detached between papilla and the ora serrata at the inner side: at the outer side it is abnormally adherent to the retina, so that the latter is easily detached on pulling hold of the vitreous: there is marked proliferation of vitreous cells at this spot.
Female, æd. 68. No. 1169.	Hæmorrhagic retinitis, secondary Glaucoma, sclerotomy performed upwards without producing diminution of tension: no cause for hæmorrhages assignable.	2 years.	T 1.	Well marked infundibular detachment.
Male, æd. 66. No. 1179.	Subchoroidal hæmorrhage followed by secondary glaucoma: cornea infiltrated: posterior synechia: large hæmorrhage pushing choroid and retina forward. Tension never very greatly increased: O.D. deeply cupped.	3 years.	T +	Infundibular detachment. Vitreous becoming vascular, and being converted into connective tissue: several large hæmorrhages in its substance.

TABLE III.—*continued.*

Sex, age, and register No.	Nature of accident, with account of chief pathological changes in excised eye.	Interval between injury and excision.	Tension at date of excision.	Pathological changes in vitreous body.
Female, æt. 67. No. 1255.	Absolute Glaucoma: quite blind for last 5 years: secondary cataract during the last 6 months: large hypopyon formed a week or two before excision: good anterior chamber. Capsular cataract, with degeneration of lens fibres: thickening of suspensory ligament of the lens: iris swollen and inflamed: choroid and retina <i>in situ</i> : some pigmentary retinitis: deep glaucoma cup.	6 years.	T +	Commencing suppurative hyalitis. Vitreous detached behind and shrunken to half its normal size: the cord connecting it with the papilla is torn across, probably during shrinking of vitreous.

TABLE IV.—*Sympathetic Ophthalmitis.*

Sex, age, and register No.	2½ months.	—T 2.	Greater part of vitreous is absorbed: what remains is drawn forwards and adherent to the iris and ciliary body: a central solid fibroid cord passes backwards to, but does not quite reach, the papilla.
Male, æt. 28. No. 1164.	Severe gonorrhœal ophthalmia of right eye, resulting in perforation of the cornea below: left eye not affected: excision of right eye recommended, but refused at the time. Return of patient in 2 months' time with sympathetic ophthalmitis in left eye. Excision of <i>right</i> or <i>exciting</i> eye, which is now shrinking: with flattened thickened cornea: iris swollen and surrounded by layer of connective tissue: lens		

Female, æet. 62. No. 1102.	absorbed : retina detached in a ridge below, and greatly swollen at the papilla ; several localised inflammatory foci both in iris and choroid.	6 months.	T. full.	Well marked infundibular detachment ; vitreous dotted with numerous minute foci of inflammation.
Female, æet. 58. No. 1243.	Preliminary iridectomy on each eye. Extraction of cataract in the left eye. Subsequent needling resulting in vision = $\frac{20}{20}$ and J 1 ; sympathetic ophthalmitis of right eye ; ultimately excision of right.	6 years.	T 1.	Infundibular detachment of the ordinary type ; at one place below the vitreous is firmly adherent to the retina, and from its gradual shrinking has detached the latter to a considerable extent.
	Right eye lost 6 years ago by ulceration of cornea with probable perforation : excision was recommended then, but refused by the patient. The <i>left</i> eye began to fail 4 months ago ; now there are several synechiæ in this eye, with slight opacity of the lens. It is questionable whether the iritis is sympathetic or not. The <i>right</i> eye had no p.l., and was now excised and presented the following changes. Cornea flat and irregular in thickness ; numerous anterior synechiæ ; iris somewhat atrophied ; lens cataractous ; choroid and retina adherent at several spots ; pigmentary retinitis : large patches of choroidal atrophy ; optic disc has a deep glaucomatous cup. Microscopically there is evidence of old choroido-retinitis : the pigmentary epithelium of the retina is disturbed ; there are groups of small cells in choroid and retina, especially at the points of adhesion.			

TABLE V.—*Extraction of Cataract, &c.*

Sex, age, and register No.	Nature of accident, with account of chief pathological changes in excised eye.	Interval between injury and excision.	Tension at date of excision.	Pathological changes in vitreous body.
Male, at. 62. No. 1119.	Extraction of cataract in the middle of April, 1882. Opaque membrane needed 12 months later: secondary glaucoma following needling: iridectomy performed downwards: 2 weeks later paracentesis of the cornea as the tension was still unreduced. Escape of a small quantity of vitreous; excision a fortnight later, as tension was still increased. Condition of excised eye was as follows: The pupil occluded by recent inflammatory exudation, iris discoloured: a dense layer of lymph covers its posterior surface: several small detachments of the retina, one extensive one anteriorly due to dragging of the vitreous.	1 year.	T +	Well marked infundibular detachment, the vitreous greatly diminished in size, much more than would be accounted for by the slight loss during paracentesis: it is solid and clear.
Male, at. 4. No. 1145.	Congenital cataract. Each eye needed 3 times at intervals of 2 or 3 months. The left eye needed for the 4th time on April 21st, 1883. Was followed by hypopyon, and suppuration along the track of the needle puncture: the pus was absorbed, but the eye remained red and tender, and tension became greatly reduced. At excision a month after the last needling, the cornea was clear, good anterior chamber, iris	1 year.	- T 2.	Vitreous greatly shrunken, wholly detached behind: projecting backwards from the pupil is a slightly opaque solid cord, which has recently been adherent at the papilla: the hyaloid membrane is also separated with the vitreous.

fairly bright, pupil occluded: iris covered behind by a dense thick layer of lymph: retina swollen and opaque, especially at papilla: both choroid and retina *in situ*. Microscopically small foci of inflammatory cells both in iris and retina: marked papillitis.

TABLE VI.—*Recurrent Iritis.*

Female, æet. 59. No. 1168.	Extraction of senile cataract followed by iritis: pain for some weeks before excision. There is a depressed scar along the corneal flap. Cornea thickened here: iris greatly swollen, suppurative iritis: papilla swollen.	2 months.	—T 2.
Female, æet. 20. No. 1340.	Patient suffering from congenital cataracts. The eyes are small, nystagmus is present: 5 or 6 needling operations have been performed on each eye at various times during the past 10 years. The left eye has become painful and glaucomatous as the result of a needling a year ago: V = shadows. T 2. As the patient was suffering great pain, excision was performed. The eye is rather small, with a very deep anterior chamber, pupil round and large: ciliary body rather small: retina slightly detached near ora serrata. O.D.: glaucomatous cupping.	10 years.	T 1.
			Infundibular detachment: suppurative hyalitis localised in the lower part of the vitreous.
			Well marked infundibular detachment. Vitreous occupies about $\frac{1}{3}$ rd its normal space: is of normal consistence: from its shrinking it has produced a slight detachment of the retina anteriorly: the hyaloid membrane is separated from the retina and floating between it and the detached vitreous.

TABLE VI.—*continued.*

Sex, age, and register No.	Nature of accident, with account of chief pathological changes in excised eye.	Interval between injury and excision.	Tension at date of excision.	Pathological changes in vitreous body.
Female, <i>et.</i> 57. No. 1260.	Recurrent iritis in each eye: the first attack 3 years ago, after living in a very damp house, and contracting rheumatism. In July 1882, iridectomy was performed on <i>right</i> eye: following September had iridectomy performed on <i>left</i> eye, which had a secondary cataract: since then she has had great pain in <i>left</i> eye. In February 1883, the cataract was extracted from the <i>left</i> eye with only temporary relief of pain: in October 1883, the coloboma was completely occluded, there was a shallow anterior chamber, bare p.l. and — T 1, with considerable pain. Excision of the <i>left</i> eye was performed. The following pathological changes were found: the iris entangled in the corneal section, considerably thickened: ciliary body greatly swollen: retina and choroid detached in several places to a slight extent: marked papillitis: retina inflamed, especially round blood-vessels.	3 years.	— T 1.	Infundibular detachment of the vitreous: the anterior part of the retina is detached from contraction of the vitreous: behind the iris is a peculiar interlacing of fine fibrous cords: these cords intercommunicate and are continuous with the vitreous behind. They consist microscopically of ill-developed fibrous tissue: the whole vitreous is tough, and is becoming fibrous: there is great increase in the number of small cells scattered through it: the branched cells are not increased.

PART II.—*Two Cases of Intra-Ocular Sarcoma, producing Sympathetic Ophthalmitis.*

THE two following cases of intra-ocular sarcoma, taken together with that brought forward by Dr. Brailey in this number of the Reports, are of great interest, as they all produced sympathetic inflammation of different degrees of severity. In the first case the damage done to the sympathising eye was so severe, that there was almost total loss of sight. In the third case (see Dr. Brailey's paper), though by no means severe, yet the inflammation produced permanent damage to the sympathising eye. In the second case the inflammation was of the very mildest form, but yet was undoubtedly sympathetic. In Cases I. and III. there was an evident perforation of the cornea. In Case II. there was no perforation whatever, though a very careful examination was made. In each instance it is probable that the tumour which grew from the choroid, produced an irritation and inflammation of the latter structure, a true form of sympathetic choroiditis of the exciting eye. It is possible that in Cases I. and III. the perforation was the exciting cause and not the sarcoma; this is more in accordance with the views held on sympathetic ophthalmitis. This cannot, however, hold good in Case II, where no perforation was present, and one is compelled to acknowledge that an intra-ocular sarcoma may alone be the direct exciting cause of sympathetic affection.

CASE I.—*Sarcoma of Choroid—Spontaneous Perforation of Cornea—Sympathetic Ophthalmitis.*

No. 1235. Samuel B., æt. 50, a stableman, was admitted under the care of Mr. Gunn, on August 19th, 1883. The sight of his right eye began slowly to fail, without any pain, four years ago; in three months it had almost completely gone. He first had pain in it a week before admission, when "something burst in the eye and water ran out." The pain then became

very severe, and he now noticed for the first time that the left eye was becoming dim; four days previous to admission he was able to read a newspaper without discomfort. The left eye had always been a good one, so there is little doubt that it had only been affected within the last two or three days.

The following are the notes on his first coming to the Hospital:

Right or Exciting Eye.—Cornea opaque, several large vessels covering it; below is a small perforation of the cornea with prolapse of iris; pupil is just visible through opaque cornea, and is filled with lymph. — T. 1. No perception of light.

Left or Sympathising Eye.—Ciliary congestion, no punctate spots on the cornea, several posterior synechiæ. Only a red reflex from the fundus; no details visible. $V = \frac{20}{100}$. T.n.

The right eye was excised.

Before giving a description of the appearance found in the right eye, it may be convenient to give the progress of the sympathetic inflammation in the left eye, from the in-patient notes.

Left or Sympathising Eye did not improve after the excision of the right eye; it remained congested, the posterior synechiæ did not give way to atropine, but increased in number till the pupil became nearly occluded. Keratitis punctata appeared, the aqueous became muddy, and the vitreous hazy. In spite of the use of atropine, counter-irritants, and rigid exclusion from light, the eye slowly became worse, and vision diminished from $\frac{20}{70}$ to counting fingers at 4".

Description of Right or Exciting Eye.—The eye was hardened in Müller's fluid for one month; it was then frozen, and an antero-posterior section made. A dark irregularly pigmented solid tumour fills the posterior part of the globe; it is somewhat mushroom-shaped, with a broad base of attachment to the posterior part of the sclerotic, external to the optic disc. It is pale in the centre, where it breaks down rather easily, becoming darker at the edges. The *cornea* is thickened in an irregular manner, and flattened; there is a central perforation. The *iris* is adherent to the cornea, and atrophied. The *lens* is absent. Between the iris and the front surface of the tumour is a

space 3 mm. in breadth filled with an old blood clot. The *retina* and *vitreous* are not visible. The *choroid* is detached anteriorly, and distinctly thickened. It is continuous with, and involved by, the tumour. At one spot, just internal to the papilla, a cross section shows a marked globular swelling of the choroid, which is to all appearance a secondary growth. The *Optic nerve* is not implicated in the growth, as far as the naked eye appearances show. The sclerotic is of normal thickness.

Microscopical Examination.—The cornea is vascular (the section does not pass through the perforation), and the epithelial layer is greatly thickened. The iris is adherent to the cornea, and atrophied. The lens is almost completely absorbed, the capsule puckered, and the capsular epithelium proliferating. The ciliary body is rather small, and separated from the sclerotic behind through traction of cicatricial tissue dragging it towards the middle of the globe, and the anterior part of the choroid has been detached from the sclerotic by the same means. Both the ciliary body and the anterior part of the choroid contain foci of inflammatory cells; the choroid more especially is very densely crowded with cells, a parenchymatous choroïditiis. The tumour is a spindled-celled sarcoma; it is very vascular, especially in the periphery, where there are numerous dilated blood-vessels, with greatly thickened walls. The margins of the tumour are rather deeply pigmented in parts; the centre remains unstained, and is undergoing fatty degeneration. The tumour evidently originated in the choroid; the enlarged part of the choroid internal to the papilla is infected with the same cells as are present in the tumour. The character of the cells of the choroid change towards the equator of the globe in a most marked manner; whereas in the posterior half they are spindle cells, in the anterior half they are evidently of inflammatory origin. In front of the tumour there is a mass of blood, apparently becoming organised in parts. The retina is almost completely destroyed. The optic nerve is not infected with the growth, but contains a large number of cells.

CASE II.—*Melanotic Sarcoma of Choroid—Suppuration of Vitreous—Shrinking of the Eyeball—Sympathetic Ophthalmitis occurring three weeks after Excision.*

No. 1370. Thirza P., 40 years of age, was admitted into the Hospital under the care of Mr. Tweedy, on February 22nd, 1884. For some few months past she has noticed that she was unable to see objects to her left side; she had some aching in her left eyeball for the first time six weeks ago. The following day the pain became excessively severe both in the left eye and temple; sickness and vomiting occurred, lasting till next day; and the lids became greatly swollen. The pain lasted four days, and was relieved by leeching. She has had no blow on the eye.

She is one of a family of seven children, who were all healthy. Her father died from phthisis: her mother from "cancer of the womb." She has always been a strong woman up to the present illness. She now looks aged, worn out, and pale.

The left eyeball is shrinking and becoming squared; the whole cornea is opaque, with a yellow line at the limbus; the iris is invisible; T.—; no perception of light.

The right eye is normal. V $\frac{20}{20}$ and J. 1.

On excision of the left eye, on February 22nd, the following changes are found.

The sclerotic is greatly thickened and puckered from shrinking of the eyeball. The cornea is small and considerably thickened. There is no visible perforation of the globe. A small black oval tumour is growing from the choroid just external to the papilla; it measures 4 mm. in the antero-posterior direction. In front of the tumour, and occupying the vitreous cavity, is a mass of greyish, friable material, looking like inspissated pus. The lens is absent, and the iris is adherent to the cornea. The choroid is abnormally pigmented, the pigment having accumulated in masses. The retina cannot be traced by the naked eye. The optic nerve does not seem to be involved in the growth.

Microscopical Examination.—The cornea is vascular and sclerosed; the anterior layers, especially at the corneo-scleral margin, are densely packed with round cells of inflammatory

origin. The ciliary body is enlarged on one side, and inflamed. The mass occupying the vitreous cavity consists of caseating pus; the posterior part of this mass has a few cells scattered through it, which are deeply stained; the greater part does not take the stain at all. There are some localised masses of blood here, and a large number of oil globules. The tumour is very deeply pigmented, so much so, that it is impossible to make a section of the central part thin enough to make out its structure; the margins, however, are less deeply pigmented, and show more clearly that it consists for the greater part of round cells, with a tendency to the formation of spindle cells and fibrous tissue in parts. A part of the choroid on the inner side of the papilla is distinctly infected with the sarcoma, though only to a slight extent. The choroid anteriorly is evidently inflamed and thickened by a growth of small cells. The retina is almost completely destroyed; a trace of it is visible close to the papilla. The optic nerve contains more nuclei than normal; that half of it which is nearest to the sarcoma contains pigment scattered irregularly through it, though there is no other evidence of the nerve being infected by the growth. The pigmentation did not quite reach back to the point where the nerve had been divided at the excision of the eyeball.

The patient was readmitted into the Hospital on March 14, 1884, nearly a month after the eye had been excised. The following notes were made by Mr. Lawford, the House Surgeon.

The patient thought herself well after leaving here till fourteen days ago, when she noticed a mist over the right eye, not permanent, but coming and going. There was some photophobia, and the eye was a little blood-shot.

Right Eye.—No ciliary congestion; very fine dots on posterior surface of cornea, chiefly central, and at the lower part; pupil rather wide, acts fairly to light; two small dots of pigment on anterior capsule. $V = 4$ J. unaided, $c + 1$ D., 1 J. barely : $c + 1.5$ (after atropine) $\frac{20}{40}$. T.n.

For the following further notes of this case I am also indebted to Mr. Lawford.

In the *left orbit* there is seen a small black nodule in the

centre of the stump, thought to be a recurrence of the growth. There is no pain or tenderness. Patient is still very anæmic and thin, with a poor appetite.

Gutt. atrop. sulph. gr. 4 ad 1 oz. ordered, to be used twice daily to the right eye, and a large shade to be worn. Quinine was administered internally.

March 18. The right pupil has responded very slightly to the atropine. Contents of left orbit removed, and chloride of zinc paste applied.

March 24. *Right eye*.—No congestion; pupil half wide.

April 10. *Right eye*.—A few fine dots can still be seen in the cornea, not in groups, but scattered over cornea singly; there are no synechiæ. Aqueous and vitreous humours clear. Optic papilla and other parts of fundus appear healthy. Vc + 1 D. = $\frac{20}{20}$ (atropised).

April 26. Patient left the Hospital.

On November 8, 1885, she writes to say that the sight is "fairly good;" that the eye looks bright, but that she sometimes suffers from sharp pains in the eye and temple.

PART III.—*Two Cases of Sympathetic Inflammation of Eyeball.*

CASE I.—*Traumatic Keratitis — Staphyloma of Cornea followed by Sympathetic Ophthalmitis—Excision of Exciting Eye—Sclerotomy in Sympathising Eye with Ultimate Excision.*

No. 1163. Joseph S., æt. 58, a labourer, was injured in the right eye by a twig while he was hedge cutting in December 1881. It is questionable whether there was a perforating wound at the time. Traumatic keratitis with staphyloma of the cornea resulted; the sight slowly failed with considerable pain for some time after the accident. In the following June the right eye was quite blind. In the middle of July (7 months after the accident) the left eye "became misty and watered." The patient came to the Hospital on September 18th, 1882, when the following condition was noted.

Right (exciting) eye. Cornea staphylomatous, opaque, and vascular; eye not tender or painful.

Left (sympathising) eye. Ciliary congestion; cornea dull and steamy; several posterior synechiæ, which do not yield to atropine: no keratitis punctata. T.n.

The right was excised and presented the ordinary appearances of a staphylomatous cornea; the latter being irregularly thickened, with the iris frayed out and adherent to its posterior surface; the lens was absorbed.

The left, or sympathising eye, soon became painful from increased tension; keratitis punctata appeared, and the posterior synechiæ became more numerous. The pupil became completely occluded, and on November 29th, a sclerotomy was performed, as there was T + 2, with aggravation of pain. The patient was discharged on December 9th with tension still increased.

He returned on June 23rd, 1883. His remaining eye was excessively painful and tender to touch, preventing him from sleeping at night. There was great ciliary congestion, cornea opaque and flattened, with a few straggling vessels on its surface. T + 1, no perception of light. The eye was excised.

Description of Sympathising Eye.—The cornea is rather small and flattened; its surface is slightly irregular, and thrown into vertical folds. An antero-posterior section of the eyeball shows a very thick solid mass filling up the anterior quarter of the globe. The iris and ciliary body are so involved that they are indistinguishable. The lens is surrounded by this solid mass, and is displaced upwards and backwards with its upper edge tilted forward. The retina is detached in an infundibular form and considerably thickened. There are some remains of the vitreous. The choroid is greatly thickened, especially anteriorly, where it becomes continuous with the above-mentioned solid mass.

Microscopical Examination.—The cornea is sclerosed, most markedly in the posterior layers. Descemet's membrane is puckered and covered, in front and behind, by several layers of long spindle-shaped cells, arranged in the same plane as itself. The solid mass behind the cornea has involved the whole iris and ciliary body. It consists of connective tissue in various stages of development; round cells, spindle cells, and fibrous tissue being present. The pigment from the iris and ciliary body is scattered irregularly through it. The dislocation of the lens is due to the contraction of this cicatricial

material. The capsule of the lens is destroyed in the upper part.

CASE II.—*Preliminary Iridectomy on Each Eye—Extraction of Cataract from the Left Eye, resulting in permanent good Vision—Sympathetic Ophthalmitis in Right Eye.*

No. 1102. Jane G., æt. 62, presented herself at the Hospital at the beginning of the year 1882. She had immature cataracts in each eye, the left cataract being rather more advanced than the right; her eyes were otherwise quite normal. She had always been a strong healthy woman. On February 20th, 1882, a preliminary iridectomy was performed on each eye, with an uninterrupted recovery. On June 15th, the cataract of the left eye was mature, and a modified Graefe extraction was performed without any complication. No reaction occurred, and the patient left the Hospital in three weeks with a perfectly active pupil, and no entanglement of iris in the operated eye. Three months later (September 5th) the vision of the left eye was—

$$c + 10 \text{ D. } \frac{20}{70}; c + 14 \text{ D. J. 6.}$$

There was a fine membrane over the whole pupillary area. This was now torn through with a needle, with the result that 10 days later—

$$V = c + 10 \text{ D. } \frac{20}{30}; c + 14 \text{ D. J. 1 at 8".}$$

The cataract in the right eye was maturing slowly, V = fingers at 1', the eye otherwise normal. Two months later (about the middle of November) the right eye became uneasy and painful. She did not return to the Hospital till January 1883, as she considered that the rapidly increasing dimness and pain of the right eye were due to the ripening of the cataract. The right eye had now all the appearances of an acute severe sympathetic inflammation. There was great ciliary congestion: there were numerous dots on the posterior surface of the cornea, some of them running into plaques; the aqueous was muddy; the iris swollen and discoloured, with firm posterior synechiæ; the anterior capsule of the lens was also covered with large dots. The eye was painful and tender, T + 1, V = shadows. The

patient was kept in a dark room; atropine and leeches were used without any relief to the pain or tension. A sclerotomy was also performed without diminishing the symptoms. Finally, the eye was excised in April 1883.

During all this period the *left* or *exciting eye*, on which the extraction of cataract had been performed, showed absolutely no signs of inflammation or even congestion. On very careful examination, not the slightest evidence of entanglement of iris or of the lens capsule could be detected in the corneal scar: the latter did not reach into the sclerotic: the pupil was active, no posterior synechia was present, the vitreous remained clear; no papillitis or congestion of the retina was ever recognised. The vision with proper correction with glasses was $\frac{20}{20}$ and J. 1, and

has remained so up to the present time. In fact a better result from extraction of a senile cataract could not be desired.

Examination of Sympathising Eye.—The globe is of normal size. The cornea is covered on its posterior surface with dots of varying size; in the lower part these have coalesced and formed a large plaque. The anterior chamber is of normal depth: the iris is swollen, discoloured, and glued to the anterior capsule of the lens; in the coloboma produced by the iridectomy, the anterior capsule is clearly seen to be covered with dots. An antero-posterior section of the globe is made: the anterior capsule is found to be thickened; the ciliary body is swollen. The vitreous is of rather firmer consistence than normal; it is detached behind in an infundibular manner, being still adherent at the papilla, but detached between this point and the ora serrata: its posterior surface is covered by numerous opaque punctate spots. The retina and choroid are *in situ*, the former being slightly thickened.

Microscopical Examination.—The cornea is somewhat inflamed: there are a considerable number of small round cells scattered through it. On the posterior surface of Descemet's membrane is a layer of cells of varying size and shape. Some of these cells are small, and stain deeply; others are large, with a single or double nucleus: these latter are evidently due to the proliferation of the epithelium of Descemet's membrane. The cells are collected in clumps, and form the dots which were visible to the naked eye: a large number of the cells are under-

going fatty degeneration. Schlemm's canal is completely filled up with small round cells. The iris is adherent to the cornea at the angle of the anterior chamber for some distance: it is very greatly thickened and densely packed with cells; the blood-vessels are enlarged, with greatly thickened walls. There is marked cyclitis: the ciliary body, however, is not much enlarged. The lens shows the globular enlargement of its fibres very distinctly; its capsule is covered anteriorly by cells of the same appearance as those lining Descemet's membrane: this layer of cells has glued the iris to the anterior capsule. The vitreous contains a great number of cells, arranged chiefly in groups. These cells are for the most part similar to normal vitreous cells; they are large, usually globular, with two or three nuclei; only a few are branched; their number is greatest in the posterior part, along the hyaloid membrane. The latter is detached with the vitreous. There is marked choroiditis. The retina is very slightly affected; here and there there is a group of cells in the anterior layers, these are most evident near the papilla.

INTRA-OCULAR SARCOMA EXCITING SYMPATHETIC
DISEASE.*

By W. A. BRAILEY, M.D.

*Assistant Ophthalmic Surgeon to Guy's Hospital; Ophthalmic
Surgeon to the Evelina Hospital.*

Eliza Masters, æt. 29. Admitted to Moorfields Hospital on August 18, 1882.

Two years ago she noticed that her *left* eye could not see objects to its outer side. Many people had recently remarked to her that that eye had begun to squint. Previously it had appeared, both to her and others, perfect in every respect. Twelve months later the sight had entirely gone. She never had any pain worth speaking of. *The sight of the right eye* began to fail about three weeks before admission.

When first seen on August 8, 1882, the *right* had well marked keratitis punctata; its pupil dilated round to atropine, though the iris was dull with some ciliary redness. There was well-marked optic neuritis. T.n.

The *left* eye had T. + 1. It was evidently shrinking, and the sclerotic of the upper ciliary region was puckered. The cornea was flattened, hazy, and vascular; the pupil large and occluded by a thin layer of lymph. There was no fundus reflex.

Examination after enucleation on Aug. 18, 1882:—The iris was rolled forward by contraction of its anterior surface; its posterior surface was adherent to the lens capsule; from its pupillary edge a thin layer of lymph extended all over the pupillary area. The retina was detached into an umbrella shape. A sarcomatous thickening occupied the upper and inner part of the choroid, its margin just encroaching upon and surrounding the optic disc. This tumour-mass measured about 10 mm. in depth from before backwards, and the same in lateral diameter. In section it presented a vascular greyish surface, through which a good deal of pigment is irregularly distributed.

Microscopical Examination showed it to consist of small round cells, which in certain areas are pigmented, in two places so

* This case is referred to in Dr. Brailey's paper on Sympathetic Ophthalmitis in "Transactions of the Ophthalmological Society," vol. iv, p. 66; and by W. J. Milles, "Trans. Ophth. Society," vol. iii, p. 66.

excessively as to constitute well-defined, coal-black patches. Towards the median line of the body the tumour thins off gradually, whereas on the outer side of the disc the bulk of the tumour-mass ends abruptly as a convex overhanging edge, though the choroid beneath it still contains a considerable number of tumour-cells for a little distance. The pedicle of the detached retina near the centre of the optic disc is constricted all round by the much-thickened sarcomatous choroid. It is highly pigmented, and numerous small tumour-cells, most of them pigmented, extend into and very much thicken the optic nerve for a distance of 2 mm. The rest of the choroid shows the inflammatory appearances described by the author ("Trans. Internat. Med. Congress," London, 1881) as typical of the choroiditis maligna which produces sympathetic disease. The ciliary body presents changes equally characteristic of the same diseased condition. Its pigment is irregularly proliferated, as is also that of the iris, which is also inflamed, though probably less so than formerly.

Mr. Milles' notes record the further progress of the *right* eye. It remained the same up till about Sept. 7th, when the dots on the cornea were noted to be diminishing. The optic neuritis was about the same. Three weeks later the patient left the hospital, some swelling of the disc being still visible. The vision was not noted either time.

Nine months later she was seen again, having been using atropine almost continuously since discharge. The eye was then noted as normal in every respect.

In connection with this case, it must be remarked that it is not the sarcoma itself directly, but the uveitis produced by it, which gives rise to the sympathetic inflammation. Also that the inflammatory appearances in each eye are, in the opinion of the author, exactly typical of the inflammation occurring with sympathetic disease. Thirdly, that notwithstanding one's prejudice against enucleation, this case furnishes another of those rather numerous examples where the process of sympathetic disease has appeared to be favourably influenced by excision of the exciting eye.

(The above case is alluded to by Mr. Milles as Case III. in his paper on this subject at p. 43.)

MISCELLANEOUS OBSERVATIONS AND CASES.

By E. NETTLESHIP.

(Continued from Vol. IX, p. 198.)

THE cases narrated below illustrate, amongst other points, certain results of blows upon the eye; remote consequences of syphilitic choroido-retinitis; recovery from severe renal retinitis occurring in pregnancy; cases of tobacco amblyopia with inflammatory appearances and hæmorrhage near the disc; an additional case of tobacco amblyopia with diabetes; a remarkable case of myopic choroiditis; nystagmus of one eye only in three brothers; choroido-retinal changes following exposure to sunlight.

The two cases of renal neuro-retinitis illustrate what is, I believe, the rule, viz., that when eye-changes occur in the albuminuria of pregnancy they are often very severe, whilst yet the prognosis both for life and sight is often better than when retinitis of far less severity accompanies the chronic granular kidney. Sight, however, is not always recovered, and I have lately seen a woman who is now nearly blind from atrophy, following severe neuro-retinitis from albuminuria during pregnancy; her urine still contains albumen, but she is in fair health.

The two cases of tobacco amblyopia are particularly interesting, since they supply striking evidence that the pathological process in this disease is at first inflammatory, and not, as has often been assumed, atrophic. Axial neuritis has, of course, been found *post-mortem* in several cases of central amblyopia, during the last four or five years; and the discs in early cases of central amblyopia have often been seen to be congested and hazy: but I do not know that hæmorrhages have been actually observed before. The case of amblyopia in a smoker with

diabetes adds nothing to our previous knowledge; we want cases of amblyopia from diabetes in persons who do not smoke, and of this Hirschberg's case in a woman is, I believe, the only good instance on record (Centralblatt, 1882, p. 202).

The notes of many of the cases have been taken by my clinical assistants, and I have especially to thank Mr. W. H. Jessop for his help in following up many of the patients and arranging some of the notes. I have always myself made or carefully verified the notes of the ophthalmoscopic appearances.

On Miosis in Irritation of the Eye.

It is a very common thing to see the pupil contracted in an eye whose cornea has been scratched or has given lodgment to a foreign body; and the pupil of an eye affected by corneal ulcer is also sometimes smaller than that of its fellow. In these cases the mobility of the pupil is not affected. In the common cases of abrasion and foreign body careful inspection will very often show that the iris of the affected eye is a little discoloured, greenish, as if iritis were threatened. This change of colour is no doubt properly accounted for by vascular engorgement of the iris without any effusion, and the diminution in the size of the pupil may be explained by the congested iris encroaching a little on the area of the pupil. It is probably correct to speak of the condition in such cases as congestion-miosis. But there are some cases of miosis following abrasion, &c., in which there is scarcely any ciliary congestion and no appreciable discoloration of the iris, although the eye is intolerant of light; and there are cases of miosis in eyes which have suffered some time before from ulcer of the cornea, but have recovered with the exception of the scar. It is not easy to explain the contraction of the pupil in these cases; if the miosis were due simply to increased irritability of the retina associated with increased irritability of the fifth nerve, we should

expect it to be more common than it is, and its degree should be in some measure proportionate to the intolerance of light; and such is certainly not the case.

Neuralgia in Cataractous Eyes.

Occasionally a patient complains of troublesome neuralgic pain in an eye with incomplete cataract. It is a question here whether the cataract is, in any way, a consequence of the pain, or whether both are associated with a common cause. Defective circulation is often a cause of local pain in arthritic maladies. Unioctular cataract has lately been attributed to lowered nutrition of the lens depending on atheroma of the corresponding carotid artery, which lessens the blood supply to the eyeball. Possibly some cause hindering the blood supply to the eyeball in some of its parts, especially in the ciliary region, may account, both for the neuralgia in persons predisposed to it, and for the cataract.

The neuralgia here referred to is to be distinguished from the aching in the eyes and over them, which is common in incipient cataract. The latter, I believe, depends upon muscular strain on the internal recti and, perhaps, the ciliary muscle, in the efforts which such persons make to compensate for their amblyopia by bringing the book closer than they have been accustomed to. The same effort to see near objects by looking more closely at them, I believe, often explains the dull frontal aching of which patients suffering from tobacco amblyopia so frequently complain on being questioned.

Vascular Supply of the Optic Disc.

There are clinical and pathological reasons for thinking that the intraocular end of the optic nerve more easily undergoes inflammatory change than parts of the nerve further back. It is well known that the disc may be very much swollen and inflamed, whilst the trunk of the nerve

shows comparatively insignificant changes, although, as can now hardly be doubted, the morbid process has travelled from the brain down to the eye, affecting most violently the part last reached. This proclivity of the disc to inflammation probably depends upon its having a freer blood supply than the rest of the nerve.

That the blood reaches the disc more readily than the rest of the nerve is shown by an imperfectly injected human optic nerve (M. 1, 5), sections of which show that, although the capillaries of the nerve generally are very imperfectly injected, those of the lamina cribrosa are much better filled than those of the parts further back.

Exactly Symmetrical Corneal Ulcers.

The corneal ulceration in purulent ophthalmia is usually symmetrical and situated below the centre. Solitary phlyctenulæ, whether on the conjunctiva or cornea, are often symmetrically disposed on the outer, less commonly on the inner, side of each globe. The corneal changes due to the friction of granular lids are almost invariably limited for some time to the part of each cornea on which the upper lid lies. We sometimes, however, meet with quite symmetrically disposed ulcers of the cornea, due neither to the lodgment of purulent discharge on the lower part of the cornea, nor to exposure of the surface of the eyeball, nor to friction by roughened lids. Thus, William R., 37, a cabdriver, had in July, 1884, a small well-defined ulcer at the junction of the upper with the inner quadrant, and midway between the margin and the pupil, in each eye; the symmetry was precise. No foreign body nor other cause of local irritation could be found, but the man himself thought that the eyes, which had been bad for some weeks, had been inflamed by small "green flies" getting into them.

It is not likely that such cases as this, and others which could easily be quoted, are really examples of any general tendency to symmetrical disease of cornea; pro-

bably all that they show is precise symmetry of the form and movements of the parts concerned.

Commotio Retinæ; Radiated Striation of Retina.

Walter A., æt. 9, was struck on the *right* eye by a cricket-ball on June 4th, 1883. He came to Moorfields on the 6th (48 hours after the accident).

This eye showed ciliary congestion; pupil dilated and pear-shaped, with the point downwards, measuring 4.5 mm. $\times$ 6.5 mm., and acting slightly to light. A streak of blood is seen on the iris. $V = \frac{20}{50}$, with $-1 D$ $= \frac{20}{20}$, and 1 J. p. p. = 4". Well-marked, *radiating*, watered-silk appearance around yellow spot; fundus well seen with $-1 D$. Left eye normal; pupil = 2.3 mm. in good light, $V = \frac{20}{20}$, watered-silk appearance much less marked than in right. Ordered blisters and atropine. On June 9th right pupil round, and extremely wide (10 mm. at least); radiating watered-silk striation as before.

The point in this case is the presence of streaks of shifting white haze *radiating* from the fovea centralis over the whole region of the yellow spot. This appearance is by no means uncommon after blows upon the eye in children, and, as the next case shows, may be permanent; I believe it is seldom seen from any other cause than injury.

Central Changes in Retina and Choroid remaining ten years after a Blow on the Eye.

Thomas Daws, now 20, had a blow on the left eye by a fist when he was ten years old. Just below the yellow spot in this eye there is a small spot of partially atrophied choroid, with slight, radiating, striated haze of retina near it. The optic disc is perhaps paler than that of the other eye. The eye had squinted since childhood, and, apart from the choroidal disease, would probably have been defective from its high degree of

astigmatism; V (with +3 D. sph. and +3 D. cyl.) = $\frac{6}{36}$.

Right V = $\frac{6}{6}$. Hm. 0.5 D. Ophthalmoscopic appearances normal.

*Concussion of Retina with Hæmorrhages, by direct violence.
Graphic description of mode of return of Sight. Slight permanent changes at optic disc.*

Clara S., married, æt. 25, in good health, the mother of three children, came to Moorfields on September 26, 1885. She said that two days before, when shaking a jacket trimmed with round, satin-covered, wooden knobs, her right eye received a severe blow from one of these. It caused her much pain, and she was totally blind of the affected eye for three hours, and the eyelids afterwards became much swollen; she did not vomit. The sight began to return about three hours after the accident; at first "it was like a small bright light in a dark room," and gradually the sight enlarged and improved to the state in which we found it on admission.

Condition of the injured (*right*) eye on admission:—V = 16 J. at 22 cm., and less than $\frac{6}{60}$. Mr. Jessop noted right eye, V $\frac{6}{0}$, 16 J. at 22 cm.

There is no swelling now of the lids, and the tension is normal. *Ophthalmoscopic appearances*.—Close to the inner side of the optic disc are three small hæmorrhages, the disc itself is paler on its inner side, and its margins indistinct; yellow spot slightly œdematous; vitreous clear. Pupil of same size as that of the left, and acts well to light and accommodation.

Left V $\frac{6}{12}$, 4 J. at 18 cm. + .5 D. cy. $\frac{6}{9}$.

September 30. Mr. Jessop found only one retinal hæmorrhage remaining, and the margin of the inner side of the disc was more distinct. V $\frac{6}{24}$ 10 J. at 22 cm. Urine; no albumen, no sugar.

On October 14, I examined her and found V of the affected

eye to be $\frac{6}{36}$ and 14 J. at 18 cm. The field was taken on the perimeter, and found to be rather contracted at the outer part. The retina surrounding the disc was rather hazy, and at the upper edge of the optic disc slight swelling was shown by the occurrence of marked parallax movement; no hæmorrhages; arteries a little diminished, and their sheaths slightly thickened.

On November 4, V was still only $\frac{6}{36}$, improved to $\frac{6}{24}$ with +2.5 D. cyl. I thought the disc was of a better colour, but the arterial sheaths were still conspicuously white. The other eye was nearly emmetropic (H. As. 0.5 D.), and had $V = \frac{6}{9}$.

In view of the considerably higher ametropia in the injured eye than in the sound one, it may be doubted whether the residual defect of the former was all, or even chiefly, due to the blow. The manner in which the woman described the sight returning first in the centre of the field was very graphic. A girl who had had temporary embolism of the central retinal artery, the plug afterwards moving on into one of its branches, described the return of her sight in almost the same terms as those used by this woman ("The Lancet," 1875, II, 491). In both cases the yellow spot was the first part to recover, because it is supplied with blood better than any other part of the retina; in the present case the temporary blindness was due to severe concussion, from which the best nourished part recovered first; in the case of embolism the re-opening of the main retinal artery took effect first on the part which contained the greatest number of blood-vessels.

Hæmorrhage beneath Retina at Yellow Spot from Straining.

A young man, William W., æt. 30, labourer, was unloading ballast from a barge into a cart, when he noticed a mist come over his left eye. Nine days later he came to Moorfields, in February, 1884. V of left = $\frac{6}{6}$ partly; that of right = $\frac{6}{6}$ well.

Several dark, well-defined blood patches were found at left yellow spot. The largest of them seemed to be exactly at the *fovea centralis*; it was prominent, and the reflecting surface of the retina was very visible in front of it; so that it must have been beneath the retina. On March 5 this large central hæmorrhage was smaller, and the lesser ones had almost disappeared. There was no history of injury; he was not liable to epistaxis, and the urine was normal.

Persistence or Relapse of Traumatic Hæmorrhage behind Lens.

Mary P., married, æt. 55, admitted at Moorfields Hospital, July, 1884. She had a blow from a fist on the right eye four years previously, and the eye had been nearly blind for eighteen months. Examination proved that with this eye she could now only see shadows; T.n., direct action of pupil bad; fundus quite dark; by focal light a thick roll of red blood was seen on the posterior surface of the lens near its border, perhaps contained in the canal of Petit? Left eye normal. Although we have no proof of the date when the blood seen on the edge of the lens was effused, the case is of interest as an example of either very long existence of a blood clot in the eyeball without decoloration, or of recurrence of hæmorrhage without repetition of the violence which presumably first occasioned it. She was only seen once.

Long continuance of Micropsia after Syphilitic Choroiditis.

Eliza R., a middle-aged woman, had iritis first in the right then in the left eye, with other symptoms of secondary syphilis, in the summer of 1880. Later on she had choroido-retinitis, causing defective sight. Vision improved, but in the left it never became perfect and remained worse at night. She came again in November, 1883, for conjunctivitis of the left. Vision of right was perfect = $\frac{20}{20}$ and 1 J.; vision of left $\frac{20}{40}$ and 4 J., with -1.25 D. = $\frac{20}{20}$. She said that things still looked smaller with the left eye than with the right, and less clear. *Ophthalmoscopic examination.*—The left eye showed widely spread superficial atrophy of choroid; no change was visible in the right.

Condition Eighteen Years after Syphilitic Retinitis.

Anne C., æt. 52, married for twenty years, had good sight until a few days after her first confinement eighteen years ago. Her account is that her vision then failed suddenly as she was reading in bed; there seem to have been no variations of sight. She had no convulsions, or other symptoms of cerebral or renal disease. As soon as she could get up she was led to an Ophthalmic Hospital, for she could not see to guide herself, and after three months' treatment got to see much better. Since then she has lived much in South America. For about seven years past the sight has again been gradually failing, but she has had no treatment; and the sight is now much worse at night than by day. When seen at Moorfields in July, 1884, she saw $\frac{6}{60}$ with each eye with her H. (6 D. in right, 3.5 D. in

left) corrected; near V was not tested with glasses, but she was wearing + 3 D. In each eye there was a posterior polar cataract with spokes and separate rings of opacity; opacities in the vitreous; extensive choroidal changes often in the form of greyish patches evidently old deposits; diffuse haze of retina in the central region, and also of the optic disc; the haze of retina was partly in front of the vessels, partly behind them; the periphery of the retina was clear; retinal arteries small.

There was no history of syphilis in her husband, but the family history was extremely suspicious, and the eye-changes were very characteristic of syphilitic disease. It is probable that the woman had syphilis very shortly before her first confinement, and thus did not infect the foetus, for the first child is living and reported quite healthy. The second child was born fifteen months after the first, and there were afterwards five others born, and two miscarriages. Of these six children born after her sight failed, three were dead at birth, and the other three died within three months, dwindling away.

The only other plausible suggestion as to the cause of the existing condition of this woman's eyes, is that it may have been the result of a very severe albuminuric inflammation. This is, however, on all grounds very improbable; she had no convulsions, she was not long confined to bed, and the eye-

changes as now seen were quite unlike those left as the result of renal retinitis even in its worst forms.

Syphilitic Iritis in an old Glaucomatous Eye.

Daniel B., æt. 45, labourer, had iridectomy performed on the right eye for "Glaucoma" by Mr. Lawson, at Moorfields, five or six years ago. He could not give much account of the character of the glaucomatous attack. He came to St. Thomas's Hospital on June 3rd, 1884, on account of double recent syphilitic iritis. The tonsils were ulcerated, and there were brownish blotches on the scalp.

There was nothing special in the characters of the attack; adhesions formed in both eyes, and in the left the iris was decidedly thickened, almost nodular. In the right, T. was slightly increased and the disc deeply cupped; there were large webs in the vitreous; V = fingers at 1' in the centre of the field. V of left was also extremely defective, but this was accounted for by the state of the pupil.

He attended till the end of the year, taking mercury and iodide of potassium, and using atropine to the left. On one occasion for a few days in the course of the treatment, atropine was accidentally used to the right, and T. was increased to at least + 1, but was restored to normal by eserine in a few days. Numerous adhesions formed in the left, and some irregular of atrophy choroid was seen around the disc, at the last examination on December 15, the disc itself being normal. Although no glaucomatous symptoms appeared in this eye, iridectomy was advised as a precaution.

This case is of interest as showing that an iris, which was very probably somewhat atrophied from glaucoma, may take on acute inflammation from a constitutional cause.

Irido-choroiditis in one Eye during a Fever, accompanied by Symptoms of Meningitis.

(Notes by MR. J. HUTCHINSON, Junr., and MR. W. H. JESSOP.)

George D., æt. 9 (p. 95), came to Moorfields in September, 1883. He had very good sight and hearing until four years old,

when he had "typhoid fever," from which he was in bed for four months; during this attack he was very delirious, and after recovery from the fever he was deaf and dumb and squinted with the left eye. Mr. Lyell tenotomized the left in rectus, and ordered him + 2.25 D. glasses.

Left eye now has many narrow bands of adhesion between deeper layers of iris and lens; pupil very irregular, but dilates considerably to atropine; small opaque spots on posterior surface of lens; in the vitreous, coming forward from the optic disc but not reaching the lens, is a white band with indistinct outline.

We have here, probably, a case of irido-choroiditis, caused by meningitis, one of the cases which, had it led to severer changes in the vitreous, might have somewhat resembled glioma.

Atrophy of one Optic Nerve after Papillitis from Erysipelas affecting Orbit during Convalescence from Scarlet Fever.

(Notes by Mr. F. W. MARLOW.)

F. D., æt. 15, came to Moorfields Ophthalmic Hospital on March 5th, 1884. He was admitted into the Homerton Fever Hospital in November, 1883, for an attack of scarlet fever, and Dr. Burgess kindly sent the following note of the attack:—"F. D. did not have a severe attack of scarlet fever, but there was perhaps more pain than usual in the throat, though no evidence of extensive cellulitis spreading from the throat. About three weeks after admission, when he was able to get up, erysipelas of the left side of the face set in. There was pain near the angle of the jaw, but the redness and swelling was most pronounced about, and on the level of, the eye."

The swelling of the face lasted a week, and when the boy was able to open his eyes he found the left was blind; there had been no pain in the eye at any time.

The condition of the eyes when he came to Moorfields was as follows:—

R. (after atropine) V = $\frac{20}{50}$ + 2.25 D. = $\frac{20}{20}$: Optic disc, too

red, margins hazy, white lines along the vein going downwards, a crescent of exposed sclerotic downwards; no proof of papillitis.

L. has no p.l. Optic disc, pale, its substance hazy and its margins ill-defined, white lines along the vessels, which are of normal size; "no proof of past swelling, but there has certainly been papillitis."

The question in this case was whether the orbital cellulitis, which no doubt led to the destruction of the left optic nerve, had spread from the throat by way of the spheno-maxillary fissure, or had extended from erysipelas of the face. The latter, which is the more common event of the two, seems to have occurred in the present instance.

Single Optic Neuritis, ending in complete Atrophy during the delirium of fever (? Typhoid).— Old Nebulæ and High Hypermetropia in both eyes.

(Notes by Mr. D. P. JAMES.)

John B., labourer, æt. 26, was taken to the Homerton Fever Hospital on October 23, 1884, for what he calls "typhoid fever"; he became delirious shortly after, and on coming to himself a month later found that the sight of the left eye had quite gone; no change had occurred since then. There was no history pointing to orbital cellulitis. He said he was sure he could see quite well with the eye until his illness, and that the other (right) eye had not been affected in any way during the fever.

He came to the Moorfields Hospital on December 20th.

No history of syphilis, fits, lead poisoning, or injury, and there were no ataxic symptoms; family history very good.

Right.—With ophthalmoscope, H. about 10 D., choroid dark; disc normal; central corneal nebula; pupil equal to left:

$$V \frac{6}{36}, + 8 D. \frac{6}{18}.$$

Left.—Central corneal nebula, causing irregular refraction, no direct action of the pupil; disc very white and opaque,

edge hazy, small defined patch of white opacity at upper margin; vessels about normal; hypermetropia about 10 D. No perception of light.

Two cases of severe Albuminuric Retinitis coming on during Pregnancy. Recovery of Health and Good Sight in both after miscarriage in one and artificial premature labour in other.

(Notes by Mr. G. D. JOHNSTON.)

CASE 1.—Anne S., æt. 29, was admitted under the care of Dr. Gervis, at St. Thomas's Hospital, in February, 1885; the particulars are given below. Shortly before she left the ward in March, Mr. Johnston and Dr. S. W. Sutton found severe, double retinitis, albumen having been found in the urine a few days before. She was complaining of some dimness of sight at this time.

On re-admission five months later I had the opportunity of examining her eyes after the œdema and exudations in the retinae had passed away. The record of the appearances at the two dates adds to the value of the case.

Previous History.—Has had the ordinary illnesses of childhood. Had rheumatic fever when 14 years old, and scarlet fever when 16. Since her marriage at 16 has suffered greatly from sharp aching pains, passing from the frontal to the occipital regions, and is hardly a day free from these pains. Catamenia regular before marriage. Married at 16; eight pregnancies in 10 years. First child born three years after marriage, æt. 10, well now; was a transverse presentation. 2. Premature labour nine years ago, eighth month. 3. Premature labour, eighth month, seven years ago. 4. Miscarriage, fifth month, seven years ago. Since that time patient has had four miscarriages, all of which occurred between fifth and sixth months.

Mrs. S. was admitted to St. Thomas's Hospital on February 25th, 1885, under the care of Dr. Gervis, on account of loss of blood from vagina. She miscarried shortly after admission; a piece of placenta was retained; it was removed by Dr. Gervis two days afterwards. She had high temperature and offensive discharge for a few days.

March 10th. Temp. normal, P. 88. Patient feeling better, but still very anæmic.

March 13th. Complaining of almost continual headache and some dimness of sight, but not of high degree. Skin pale and pasty-looking: some slight anasarca about back and abdominal wall; some puffiness below the eyes.

Lungs.—Some deficiency of resonance at left base posteriorly, and a few râles to be heard at root of R. lung. Otherwise normal.

Heart.—Apex-beat in fifth space one inch external to nipple. No increase of dulness upwards or inwards.

Pulse 90, tense. Vessels thickened. Urine, sp. gr. 1015, turbid, some mucus. Albumen $\frac{1}{6}$. A number of vaginal epithelial cells and some amorphous phosphates. No casts.

March 15th. Eyes examined by Dr. S. W. Sutton.

R. O.d., very swollen and rather pale. Veins tortuous. At y.s., a large group of very small bright white dots, and around this some large patches, white and soft edged. Several hæmorrhages, mostly rounded in shape.

L. O.d. as in R. Many patches of white exudation, larger in size than those of R., scattered about y.s. region, and a few to inner side of o.d. No small white spots as at R. y.s. Hæmorrhages more numerous than in R.

She left the hospital on March 18th, and was re-admitted on August 10th, 1885, on account of a mass protruding from the os uteri, about the size of a hen's egg. This was removed and turned out to be a placental polypus. At this examination patient was found to have a bi-lobed uterus; there was also found the remains of a vaginal septum.

On August 18th, Mr. Johnston asked me to examine her eyes, and I made the following note:—

O.ds., very pale, retinal arteries diminished, a little haze of retina in many parts, and scattered small rounded black dots, sometimes lying upon bases of choroid paler than the rest. Group of fatty dots at each y.s.; more in R. The black dots tend to be grouped near large vessels at periphery, but are also scattered round each disc.

August 24th. Urine sp. gr. 1012, acid, albumen $\frac{1}{10}$. Deposit of granular hyaline and a few fatty casts. Some epithelium from urinary tract.

CASE 2.—Jane D. (p. 135), æt. 40, married. Came to Moorfields in February, 1884. She was a stout florid-looking woman, in an advanced state of pregnancy, and said that she had suffered from severe frontal headaches, lasting four or five hours, from October to December, 1883, always accompanied by vomiting. Since December the headaches had stopped, but early in January a severe cough came on and her sight failed. She had been married 19 years, and had 10 children and three miscarriages; the eldest child was 17 years old and healthy; the youngest 16 months old. Her face, arms, and legs always swelled during pregnancy, but the eyes had never been affected before, nor had she suffered from headaches.

With the right eye she could on admission see only letters of 20 J., but with left she saw $\frac{6}{24}$. The ophthalmoscope showed severe papillo-retinitis in each eye; general haze and œdema, abundant soft white patches and hæmorrhages, bright white dots at yellow spot. All the symptoms more marked in right eye.

“The changes indicate that the duration of the disease is not less than two months, and point to its being still in progress.” There was marked pitting of the legs; urine, 1005, acid, albumen about $\frac{1}{20}$ th.

At Mr. Nettleship’s suggestion, Dr. Julius Cæsar, her medical attendant, induced premature labour; turning had to be done for a breech presentation, but the child died from pressure on the cord.

The patient came again in a few weeks (March 26), looking in very good health. In both eyes the changes were clearing up, optic discs less hazy, and the vessels, especially the veins, smaller; towards the periphery numerous scattered black pigment spots, often surrounded by a narrow collar of whitish choroid; still numerous scattered soft buffy-white patches, and one large hæmorrhage in the right eye. Sight improved, especially in the left, as follows:—

R: 18 J. at 8" and $\frac{1\frac{1}{2}}{60}$.
 V:
 L: 8 J. at 8" and $\frac{6}{9}$.

On July 1st, 1885, she came much improved in health and

colour, and two months pregnant. Her vision was the same, and the note states (that in the left eye) there are abundant small white dots clustered between the optic disc and the yellow spot, and that for a long distance the sheath of the inferior macular artery is thickened by ensheathing white tissue: in the right eye, numerous scattered small white spots, and a small patch of thickening on a vein up and out from the optic disc. All the hæmorrhages had disappeared.

Rapid onset of Tobacco Amblyopia with Inflammatory appearances, and a Retinal Hæmorrhage in an intemperate Smoker, with Dilated Capillaries. Rapid Recovery. ? Influence of Snuff-taking.

(Notes by Mr. MARLOW and Mr. JESSOP.)

D. Cromartie, æt. 54, clerk, a tall, robust, florid Scotchman, with acne rosacea, came to Moorfields on May 17th, 1884. His sight had failed rapidly in both eyes just a fortnight before; he said that on getting up one particular morning he found that he could not see to brush his hair, and that he could not read. On being asked, he said that people's faces looked pale, that he saw better in a dull light, and that he confused copper with silver. Visual acuteness was exactly the same in each eye, $\frac{20}{0}$

and 20 J. barely with +3 D. There was a well-marked central scotoma for red and green—densest outside the fixation point. *Ophthalmoscopic examination.*—Optic discs much too red, margins hazy and striated; to the inner side of the left disc, lying just below an artery of considerable size, was a well-marked linear hæmorrhage in the retina: there were no other hæmorrhages in either fundus. He had smoked since he was a boy; for thirty or forty years he had smoked 2 ozs. of cavendish a week. He habitually drank a good deal—taking rum, brandy, and sherry; ale gave him diarrhœa. The urine contained neither sugar nor albumen. He was told to leave off smoking, to wear neutral-tint glasses, to apply a series of blisters to the temples, and to take nux vomica with an occasional purge.

On June 7th vision had improved to $\frac{20}{70}$, and with +3 D. he read 2 J. fairly. The hæmorrhage in the left was still visible,

but much faded; optic discs paler and less hazy; the right disc was clearer and paler than the left, and on its upper and outer part were some loops of very small dilated vessels. The left disc besides being less clear than right, shows marked white thickening of the sheaths of its descending artery and vein.

On July 5th R. V = $\frac{20}{50}$, H.m. 0.5 D. = $\frac{20}{40}$, L. V = $\frac{20}{30}$, not

improved by glasses. With both eyes together he reads 1 J. with +4 D. *Ophthalmoscopic examination*.—The two discs were now less alike; the *right* was very pale on its outer third—this pale segment being sharply marked off; the patch of small dilated vessels was still present just above the upper edge of the pale part: the *left* disc was rather hazy, and pale all over, unlike the right.

He had almost entirely given up tobacco, but still smoked two cigarettes a day; he had continued to drink as much as—indeed he said more than—usual during the whole of his attendance. It came out on enquiry that a fortnight before his sight failed, having a bad cold, he took snuff largely for some days, and it is possible that this may have been the exciting cause of the attack.

Recent Tobacco Amblyopia affecting one Eye earlier and more severely than the other. Retinal hæmorrhage in the Eye last attacked. Recovery. Patient a Teetotaller.

(Notes by Mr. W. E. CANT, F.R.C.S.)

John C., æt. 40, applied at the Moorfields Hospital on the 16th of August, 1885, stating that the sight of both eyes was failing, the left having begun six weeks previously, and the right more lately. He had hitherto had very good sight. Except that he could see better in the dark than by full daylight, there was nothing else to note about the defect of vision. He was a labourer in good health, and had had no other symptoms. He smoked 2 ozs. of twist tobacco a week, and had been a teetotaller for the last ten years. No history of syphilis or other constitutional disease. The urine, tested a few days later, was acid, clear, and free from both albumen and sugar.

State of Eyes on Admission.—*Right*, V $\frac{6}{18}$ and 6 J., not im-

proved by any glass, pupil normal, slight My. by ophthalmoscopic measurement. Defective perception of red extending from fixation point for about 15° to its temporal side; this defect was but slight at the fixation point, but was more marked a little to the outer side. The optic disc was rather misty, and a single *linear hæmorrhage of moderate size was seen near the disc* passing downwards and outwards. *Left*, V $\frac{6}{60}$ and 16 J., not

improved by glasses; refraction myopic as in right; pupil smaller than in right, but normal. A large central scotoma for red of greater density than in right. Optic disc rather misty, but notably paler on the temporal side than that of the right eye; no hæmorrhages.

Some strychnia was prescribed, and he was told to leave off smoking.

On November 21st, visual acuteness had improved in the right to $\frac{6}{9}$ and 1 J., and in the left to $\frac{6}{12}$ and 6 J. The retinal hæmorrhage in the right had disappeared, but the discs had not changed in aspect; the left being paler than natural, especially on its outer side, and slightly veiled; the right of fuller colour, and rather more veiled. He had almost ceased smoking, but still took a pipe occasionally.

Central Amblyopia in a Smoker suffering from Diabetes.

(Notes by Mr. NAPIER.)

Alfred M. (p. 217), shop assistant, æt. 31, came to Moorfields on April 11, 1885. He was a spare-looking man, with thin and somewhat sallow face. He had been quite well till March, 1883, when he had pains in his loins, and general weakness. He attended under Dr. Wickham Legg at St. Bartholomew's Hospital, for diabetes, from November, 1883, to January, 1884. Two months before I saw him the sight of both eyes began to fail, and had been getting worse ever since—everything looking hazy. He said that he preferred full daylight to dusk, and that everything seemed to go black about twilight. He had smoked for about ten years, and used to smoke pipes a great deal three years ago, but for the last year, as pipes made his tongue dry, he

had only smoked three cigars a week, and sometimes none at all. He had drunk moderately, never excessively, sometimes spirits, but chiefly beer. Had gonorrhœa four years ago. His father and eldest brother have gout; no relative suffers from diabetes or phthisis.

On admission:—*Right*, $V = 18 \text{ J. at } 12 \text{ cm.}$, and not $\frac{6}{60}$.

Left, $V = 16 \text{ J. at } 12 \text{ cm.}$, and not $\frac{6}{60}$. Pupils:—*Right*, 3.5 mm. ,

action slow, and it remains smaller than left during accommodation. *Left*, 4 mm. , action normal. Well-marked central scotoma for red in each; field for red contracted. *Ophthalmoscopic examination*:—*Right* disc paler than left; no retinitis or cataract. Urine, 1032, acid; no albumen, but a good deal of sugar. Knee jerks absent.

August 8. Sight about the same. *Right*, $\frac{4}{60} 16 \text{ J. at } 22 \text{ cm.}$

Hm. 1 D. $\frac{6}{60}$. *Left*, $\frac{3}{30} 16 \text{ J. at } 22 \text{ cm.}$; not improved. Urine, 1035, acid; sugar still present in considerable quantity.

November 25. Health much better, but has a cough and has been spitting blood; is still carefully dieting himself. Urine sp. gr. 1030, no albumen, but still contains much sugar. Knee jerks absent. Pupils rather large, and act only slightly to light, the right being, as before, always smaller than left. His sight has improved a good deal:—

Right, $V \frac{6}{18}$, Hm. 1 D. $\frac{6}{12}$; reads 4 J.

Left $V \frac{6}{18}$, Hm. 1 D. $\frac{6}{12}$; reads 4 J.

Myopia from Childhood. Rapid increase, soon after Marriage, to almost total Blindness. Question of Myopic Choroiditis.

Frederick R. L., now 51, a schoolmaster, has been short-sighted since he was a boy, but his sight kept very good until he married at the age of 35. Within six weeks from his marriage he began to have confusion in reading, the right eye getting worse than the left. Two years later, being by this time able to see very little with the right eye, he consulted Mr. Windsor

at Manchester, and says that the diagnosis was "atrophy of the choroid." His sight has continued to get steadily worse in both eyes. For the last eight years he has not been able to read print, but until a few months ago he managed to carry on his teaching chiefly by black-board work. He showed us some spectacles which he had had for several years, they were — 8 D. On examining with the ophthalmoscope, myopia of about 18 D. was found in each eye, with very extensive choroidal changes exactly alike in the two eyes; the central region of the choroid (including the yellow spot and the whole of the circum-papillary area), was completely atrophied with scarcely any pigmentation; but towards the equator this appearance passed into that of closely aggregated round patches of somewhat less complete atrophy, associated with a good deal of pigmentation. The peripheral changes were, indeed, exactly like those caused by syphilitic choroiditis.

Notwithstanding the entire absence of choroidal tissue for some distance around the disc, the disc itself and the retinal vessels looked quite healthy.

The rapidity with which the sight failed in this patient certainly seems to favour the prevalent doctrine that the choroidal atrophy accompanying myopia is, or at any rate may be, the result of a preceding choroiditis. This view was favoured by the great accumulation of pigment towards the border of the diseased region. On the other hand it is difficult to understand how an active, even if sub-acute, choroiditis, if severe enough to end in complete absorption of every trace of choroidal tissue, could take place without the inflammation being communicated to the optic disc and retina. A patch of syphilitic choroiditis close to the disc almost always gives rise to simultaneous papillo-retinitis leading to some atrophy.

Of much interest also is the occasion which seems to have exercised so serious an influence on the nutrition of this patient's sclerotic and choroid. I could not make out that he worked harder after marriage than before; he assured me that he was comfortably off, and that his work

continued to be of the same kind and amount as it had been, still he was perfectly definite in his statement as to when the failure began. I questioned him as to syphilis, and found no reason to think that he had suffered from it. I forgot to ask him whether any of his kinsmen were shortsighted.

Unsymmetrical Nystagmus in three Hypermetropic Brothers; the same Eye affected in all. Strabismus following the Nystagmus in one.

Michael G., came to Mr. Wordsworth on January 31st, 1883, for convergent strabismus, and after atropine + 4·5 D. spectacles were ordered for constant use. He was then aged 7.

March 4, 1885. His mother says that before the squint came on the left eye "danced," just like the other two sons'; the "dancing" lasted off and on for many months, and then gave way to the squint. Has no squint now with the glasses, but the left eye squints inwards as soon as the glasses are taken off.

Lewis G. (p. 206), came to Moorfields in January, 1883, under the care of Mr. Wordsworth, for slight ophthalmia after measles, and was noticed to have nystagmus of the left eye. On July 15th following, the note is: "Has no nystagmus now."

March 4, 1885. Has no nystagmus or squint; he is liable to fits, during which he turns "black in the face" and loses consciousness, the last one was nine months ago. Age not stated, but he was between the other two brothers.

Percy G., æt. 14 months, came to Mr. Nettleship at Moorfields on Feb. 25th, 1885. He had lateral, moderately quick nystagmus of the left eye, which had been first noticed only three days before. He is a healthy, quiet child, and has had whooping cough, mumps, and one fit when three months old. The mother said the right eye did not "dance;" I thought that it once or twice oscillated a little, but at the most this was doubtful.

March 14. The nystagmus is as before. There is H. about 3 D. in each eye; fundus healthy.

Unsymmetrical Nystagmus with Rhythmical Movements of Head and corresponding Arm, beginning at the Age of Six Months.

George T., æt. 15 months, was sent for examination by Mr. Godlee on Feb. 18, 1885.

When 6 months old, "working" movements of the left eye, head, and left arm, were noticed, but lately the movements of the left arm had ceased. On waking the eye is still for twenty minutes, and then the movements commence again.

The left eye now shows a constant, quick, small, lateral nystagmus; pupil acts to light well, and also acts at times when the right one does not; the right pupil is often larger than the left. There is a constant, slow, rotatory shaking movement of the head, but it is much slower than the oscillations of the eye.

He seems to see equally well with each eye.

Central Choroido-retinitis in one Eye, probably caused by Exposure to Sunlight.

J. F. U., an excise officer, æt. 34, came to Moorfields on July 27, 1885, stating that when shooting at Wimbledon in the hot sun during the previous week, he had noticed that in the evenings everything looked reddish with the left eye, and also that he did not shoot well in the mornings. Two days after returning from Wimbledon, he found that a "dark spot" came over his left eye.

There was no history or evidence of syphilis. Vision was on admission almost, if not quite, equal in the two eyes; with each he read 1 J.: media and fundus normal.

Ophthalmoscopic Examination.—In the *right*, the media and fundus were normal. In the *left*, the yellow spot region was darker than in the right, and several small pigment collections were seen lying upon palish spots about the circumference of the yellow spot, together with very fine whitish stippling about the *fovea centralis*. He was ordered smoked domed glasses.

On August 26th the ophthalmoscopic changes were the same.

Notwithstanding the asymmetry of the disease, the exposure for some days to powerful sunlight seems the most probable cause of the disease.

*Congenital Defect of Sight ; Marginal Thickening of Cornea ;
Nystagmus.*

R. R., æt. 35, has always seen very badly, and he has rotatory nystagmus. The palpebral fissures are set obliquely upwards and inwards. With the right eye he can only see the hand moving at 18''; the iris of this eye is tremulous. The left sees 10 J. at 2'' or 3'', and counts fingers at 2', not improved by glasses. Pupils measure 1·5 mm., act but little to light, and dilate very little to atropine. The margin of the cornea in each eye is covered all round by a superficial, hazy, raised zone, as if the conjunctiva had encroached beyond its natural limits; it is broader and better marked in the left eye than in the right. The fundus could be well lighted by the ophthalmoscope, but no details were visible owing to the oscillation.

ON SYMPATHETIC INFLAMMATION OF THE EYEBALL.

By R. MARCUS GUNN, M.A., M.B.,

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THE following cases were under my care while House Surgeon at Moorfields, and they are now published with the kind sanction of those of my colleagues to whom they belonged. For the valuable pathological notes incorporated in this paper I am indebted to Dr. Brailey, who examined the eyeballs while Curator of the Museum.

CASE I.—*Penetrating Wound of Globe followed by Severe Sympathetic Inflammation twenty-four days later. Excision of Injured Eye three days after Commencement of the Inflammation. Steadily Progressive Destructive Ophthalmitis soon leading to Ciliary Staphylomata, and Shrinking of Cornea with Diminished Tension. Excision of Second Eye at Patient's Request.*

Edwin J., æt. 24. Admitted November 29, 1876.

Right eye injured four weeks ago by a fragment of steel. There is a wound in the lower sclero-corneal junction with large prolapse of iris. No anterior chamber. Iris discoloured.

Left eye. Sight became dim three days ago. Next day pain commenced and has continued ever since. There is now severe iritis with much ciliary injection. V = bare perception of large objects.

Right excised. (The piece of steel found in lower part of vitreous.)

Treatment.—Iodide of potassium, cinchona, calomel and Dover's powder. Mercurial inunction to slight salivation, and stimulants. Gutt. Atrop. gr. 4 ad 1 oz. frequently. Great pain and much sleeplessness during stay in hospital, relieved temporarily by subcutaneous injections of morphia. Dec. 11. Bare perception of light. Jan. 7, 1877. Small ciliary staphylomata have been developing themselves during the last few days.

13. The ciliary staphylomata have become much larger, especially above: two of them pricked with fine needles. Feb. 8. The upper staphylomata are now larger than the cornea: the latter is much smaller than before. They have been repeatedly pricked lately. Pain not severe, and now only occasional. Doubtful perception of light. Discharged.

March 2, 1877. Re-admitted. The eye has been painful for the last week. Globe enlarged and much deformed by irregular ciliary staphylomata. No perception of light. — T. 1. 3. *Left* excised at his own request. 14. Discharged.

Pathological Examination.—*Right eye*:—globe somewhat enlarged, measuring 26·5 mm. antero-posteriorly, 27 mm. laterally, and 26 mm. vertically. T. +. Cornea clear. Iris greenish. No anterior chamber. At the lower inner sclero-corneal junction is a bulging, formed by a tough protrusion of thickened iris covered with lymph. *Equatorial Section*:—Retina detached and contracted, with numerous blood-clots firmly adherent to its outer surface. Choroid *in situ*; the space between it and the retina is filled with dark red liquid blood. This subretinal space is traversed by a long firm band of tough lymph, pointed above where it adheres to the choroid and sclerotic at upper part of globe, and thicker below where it springs from the upper part of the partially contracted retina. The upper part of the retinal cavity is occupied by firm, translucent, comparatively unaltered vitreous. The rest of this cavity is filled by a deep-yellow purulent mass in the lower part of which (or just behind the ciliary processes) a long scale of metal is embedded. The choroid appears normal; sclerotic slightly thickened. Lens absent. An *antero-posterior section* of the anterior half shows the ciliary body enormously thickened, tough and greyish translucent with an irregularly scattered line of pigment bearing on its inner surface a greyish-yellow purulent substance like that enclosing the foreign body a little further back.

Left eye:—Globe measures 27 mm. in its antero-posterior, 24 mm. in its lateral, and 23 mm. in its vertical diameter. — T. 1. The cornea is embraced in its upper inner two-thirds by a long narrow staphyloma, greyish in colour and slightly soft. Cornea itself is rather small, with translucent centre, through which the outline of the pupil is dimly visible; its margin is

hazy with ramifying blood-vessels. Except at the staphyloma the sclero-corneal junction is very much depressed as if tied in. Vitreous entirely absent, and its place occupied by serous fluid. Choroid tough, grey, gelatinous and enormously thickened (from 2 to 2.75 mm.): it is lined by a thick, irregular, not very black pigment layer. Inside the cavity of the choroid the retina is lying in close contact with it upwards, inwards, and downwards, but is disposed in loose folds on the outer side.

CASE II.—Old Penetrating Wound of Globe. Recent Pain and Inflammation followed by Sympathetic Inflammation about two months later. Excision of Wounded Eye fourteen days after Appearance of Sympathetic Inflammation. Iridectomy a few days later. Destructive Inflammation.

Allen D., æt. 23. Admitted Feb. 3, 1877.

Right eye injured three and a half years ago: penetrating wound of cornea from piece of iron about the size of a hazel nut. A fortnight later he lost the sight of this eye entirely, but it remained quiet till eleven weeks ago, when it became red and painful. There is now a small central leucoma in cornea with blood-vessels running up to it. Iris indistinct and very dark. Pupillary area opaque. There is a small dark staphyloma in the sclerotic just outside the corneal margin, slightly to the inner side of the median line below.

Left eye first felt an uneasiness fourteen days ago. Since then there has been dimness and much pain. There is now iritis with considerable ciliary injection and photophobia. Pupil irregular from posterior synechiæ.

Right excised. (No foreign body found.) *Treatment.*—Quinine, mercurial inunction to slight salivation. Heurteloup's leech to temple when pain severe. Gutt. Atrop. gr. 4 ad 1 oz. frequently. 14. Pain continues to be severe. + T. 2. Iridectomy done down and in. 15. Pain relieved. 19. Anterior chamber reformed. Aqueous clearer. No pain. T.n. Slight tendency to bulging at site of iridectomy. 25. Has had pain for the last two days, especially severe at night. 26. Anterior chamber gone. More ciliary bulging, less pain. The ciliary bulging continued to increase with little pain until March 23, when he was discharged with doubtful bare perception of light.

Feb. 26, 1878, he writes to say that his eye feels strong, but that he can only distinguish light from darkness.

Pathological Examination.—T. slightly —. Cornea flattened. Globe of normal size except that its antero-posterior diameter is diminished. Staphyloma in lower inner equatorial region and another smaller one to the inner side and 6 mm. in front of the *optic disc*. Vitreous shrunken to about one-fourth its normal size, taking the retina with it. The posterior part of the retina is tubular, the lower border of the tube being connected with the choroid below by tough, translucent, stretched tissue, apparently fibrous in structure. In the equatorial region the retina is closely adherent to the choroid at certain points, between which are intervals where it is detached and shrunken into folds, giving it a sacculated appearance on section. The retina evidently exercises considerable traction on the choroid and sclerotic where these adhesions exist; this is seen especially at the optic nerve entrance, which is drawn well forward and the adjacent choroid much thickened (possibly by the mechanical traction). From this point the choroid thins off gradually in front till it is of about normal thickness near the equator; at the staphylomata, however, it is very thin. The anterior surface of the iris is covered with a closely applied layer of greyish, semi-translucent lymph, which is closely adherent to the posterior corneal surface. The posterior surface of the iris adheres to the remains of the shrunken lens-capsule. Blood-clots are found in the anterior and posterior parts of the retinal cavity. The vitreous is represented by a small quantity of opaque tough tissue. On the ciliary processes and extending to their apices is a layer of hard substance that cuts like cartilage. The pigment epithelium lining the choroid is dark and somewhat irregular. At the staphylomatous bulging a thin greyish layer is found on their internal surface, and at these points the choroid is very closely adherent to the sclerotic. Dr. Brailey remarks:—"There has been irido-cyclitis with development of fibrous tissue in the anterior part of the vitreous cavity; also some spots of choroiditis and adhesion of these to retina. Some spots apparently of old inflammation where choroid and sclerotic have passed into atrophy, and are closely adherent. Great traction on posterior part of globe. No foreign body."

CASE III.—*Lost Inflamed Eye followed by Sympathetic Inflammation. Excision six weeks later. Destructive Iritis in Sympathising Eye.*

Henry C., æt. 34. Admitted April 28, 1877.

Left eye lost "from being poisoned by the bite of a grey fly like a mosquito, but larger," in the Island of Ceylon about six months ago. This eye was excised elsewhere about six weeks ago.

Right eye. About three months ago he noticed dimness in this eye. The sight gradually grew worse without pain for about three weeks, but then it became painful. The vision was as bad as it is now before removal of left. Now the iris is bulged forward, thick and very vascular. Pupil closed. Bare light perception. T.n. Occasional pain. Ordered belladonna fomentation, Gutt. Atrop. gr. 4 ad 1 oz., and quinine internally.

He states that about two days after the fly-bite he lost the use of the corresponding (left) side of his face, and deafness began in the left ear. He is now very deaf; can just hear the watch on contact in the right and not at all in the left ear. Tuning fork heard indistinctly on both sides. Membranes look slightly thick but are otherwise normal.*

May 17. He thinks his sight is better. Advised to return in about a year; sooner if in much pain. Discharged.

CASE IV.—*Old Lost Globe from Perforating Ulcer. Sympathetic Inflammation about thirty-nine years later. Excision. Improvement.*

James C., æt. 39. Admitted June 13, 1877.

Left eye lost from ulceration shortly after birth, probably ophthalmia neonatorum. Old perforation with extensive anterior synechia now bulging considerably. T.n. Bare perception of light.

Right eye has occasionally seen muscæ for some months past.

* The entire seventh nerve seems to have been affected, both portio dura and portio mollis. May the deafness be due to past sympathetic inflammation of the middle or internal ear? Or is there any connection between the affection of either seventh nerve and the inflammation of the injured eye?

Has now iritis of about eight days' duration; posterior synechia below; pupil sluggish. Anterior chamber deep. T.n. Slight pain and dimness.

Left excised. Mercurial inunction and strong atropine drops. 15. Pupil now well dilated; posterior synechia has given way. July 18. $V = \frac{20}{50}$ not improved by spherical glasses. Eye looks quiet. To continue atropine. Discharged.

Re-admitted Sept. 14. Complains of pain down the nose and at inner canthus on right side. Slight swelling of upper lid at inner canthus. Conjunctiva injected. Ordered atropine drops to eye, and iodide of potassium and chloral hydrate in mixture. A few days later pupil was widely dilated. Anterior chamber large and deep. $V = \frac{20}{70}$ about, better in morning and worse as the day goes on. Atropine now discontinued. 24. $V = \frac{20}{40}$ Hm $\frac{1}{36} = \frac{20}{20}$ (letters). Eye feels easier. Discharged.

Examined on Feb. 27, 1878. Lids still swollen and irritable. Much mistiness and lacrimation at times, worse in gas-light. Occasional pain in the eyelids and at inner canthus, also over the orbit and in the temple. Subconjunctival vessels large. Ciliary injection. Numerous minute dots on posterior surface of cornea. Pupil active. T.n. Sight still weak; occasional attacks of dimness lasting for some time. Media hazy. Optic disc rather injected. $V = \frac{20}{30}$ fairly. Hm $\frac{1}{30} = \frac{20}{20}$ partly.

Pathological Examination.—Antero-posterior and lateral diameters slightly increased. Vitreous fluid. Retina and choroid *in situ*. Optic disc deeply cupped, its blood-vessels small; it is surrounded by a ring of atrophy, much wider down and out. The iris appears as a black layer on the posterior surface of the cornea, and is stretched and greatly thinned. A scale attached to the middle of the iris probably represents the remains of the lens, and towards this the apices of the ciliary processes are greatly stretched and elongated.

CASE V.—*Operation on Lost Globe. Severe Sympathetic Ophthalmitis about ten weeks later. Excision of Exciting Eye fourteen days after Sympathetic Symptoms. Iridectomy Attempted two months later, and Lens Extracted after other two months. Iridotomy eight months later. Result Bad.*

Emily G., æt. 15. Admitted Jan. 11, 1877.

Right eye. Dense leucoma of cornea. Bare perception of light. Result of ophthalmia neonatorum.

Left eye perfectly sound.

Right. 12. Part of surface of leucoma sliced off from outer and upper periphery and from near centre with a bent broad needle. Central disc of corneal tissue removed by trephine and shrunken remains of lens removed through the opening: vitreous presenting. 13. R. E. no pain. Has perception of light. 14. There is now an opaque white film forming over trephined area. 16. R. E. — T. 1. The opening in cornea filled with soft opaque substance of new formation. No irritation. 18. — T. 1. The newly-formed substance now projects. Feb. 8. Discharged.

Re-admitted June 8. R. E. Globe now considerably shrunken, with large vessels running down in a leash to the trephined spot. It has been painful since last visit. L. E. about fourteen days ago this eye became painful, and the sight dim. Pupil small; many posterior synechiæ; dilates irregularly under atropine. Iris velvety. Marked ciliary injection. + T. 1? R. E. excised. Ordered strong atropine drops, and dark bandage. 18. Much *in statu quo*; she says sight is more dim. 29. Less injection and less pain for last few days. Discharged.

Re-admitted Aug. 21. The eye began to be painful again about fourteen days ago. Cornea hazy; slight ciliary injection; iris velvety; pupil irregular. + T. 2. Ordered Gutt. Atrop. and dark shade. 22. Iridectomy attempted upwards, no iris could be obtained either with blunt hook or forceps. 26. A little blood in anterior chamber. Sept. 2. Slight pain last night. Blood now absorbed. 12. T.n. No pain. Counts fingers barely at one foot. Pupil occluded and excluded. Iris bulging forwards making a. c. very shallow. Sight rather better than on admission: "the thick fog has nearly gone away." To have dark glasses. Discharged.

Re-admitted Oct. 12. Cornea looks small. Pupil closed, immovable under atropine. Iris bulged forwards. No a. c. Bare perception of light. + T. 1? 18. Has had occasional shooting pain over top of eyeball, relieved temporarily by Heurteloup's leech. 23. Linear corneal incision above; iris snipped at either extremity with Wecker's scissors. Lens removed nearly entire. The iridectomy was then easily completed. 27. Eye watery with occasional pain. Nov. 4. No pain now. Lymph gradually filling coloboma. Bare perception of light. 7. Pupil and coloboma nearly filled with lymph. 12. T full. Slight aching pain. 13. A little effusion of blood in pupil. Globe very tender to touch. T.n or slightly —. 23. Much pain occasionally in right orbit. Had slight aching in left eye yesterday. 26. Eye was again painful at intervals during yesterday; better to-day. Dec. 6. Complains of pain shooting between the two orbits, relieved by warm bathing. 10. Coloboma full of lymph, partially vascular. T.n. Iris in contact with cornea. Bare light perception. Large vessels run down through cicatrix into anterior chamber. No pain. Iris vascular. Discharged.

Re-admitted June 14, 1878. Eye is quieter now, and the sclerotic conjunctiva is of normal vascularity except above, where conjunctival vessels run into the corneal cicatrix, and form a vascular plexus on organised lymph in the pupil. Globe somewhat shrunken. — T. 2. Anterior chamber absent or very shallow. V = bare perception of light. Since last discharge she has had occasional pain in the eye, occurring every few days and lasting for about a day; it is relieved by warm bathing. She has had headache, pain shooting from the vertex to across the forehead or *vice versâ*. June 18. Iridotomy from inner side. No gaping occurred. A little iris pulled out piecemeal by forceps after repeated trials. 28. V as before. July 17. V unchanged. No appreciable pupil remains from the operation. Discharged.

Pathological Examination.—On equatorial section the retina is soft, wrinkled, and lies loosely in position, and a yellow serous fluid escapes from its cavity. The ciliary processes are much thickened, and are entirely covered with a greyish-white, tough layer. The choroid is thickened over a considerable part of the outer wall, and possibly slightly so over the rest of the globe.

The iris is somewhat thickened and is closely adherent to the cornea; the pigment of its posterior surface is irregularly scattered and bears a fibrous layer on its posterior aspect.

CASE VI.—*Rupture of Ciliary Region from Blow. Sympathetic Ophthalmitis five weeks later. Excision. Partial Recovery.*

James F., æt. 58. Admitted March 13, 1877.

Left eye. Globe ruptured three weeks ago by blow from a cow's horn. Lens dislocated beneath conjunctiva in upper inner ciliary region. Margin of iris detached at outer side. Blood in anterior chamber. Ordered Heurteloup's leech and belladonna. 30. Severe pain last night preventing sleep. 31. No pain now. April 2. *Right eye.* Injected. Sight misty. No pain. April 3. *Right.* Pupil inactive. Ciliary injection. Posterior synechia seen under atropine. $V = \frac{20}{\text{nil}}$. Jaeger 20 at 10''. *Left* excised.

Strong atropine drops to right. April 27. Sight has slowly improved, and the synechiæ have all yielded except one. Discharged.

Examined on Feb. 22, 1878. Slight ciliary redness. Posterior synechia below. Stellate opacity in middle of anterior capsule? lymph. T.n. Has occasional severe pain in inner supra-orbital region. $V = \frac{20}{70} \text{ H } \frac{1}{30} = \frac{20}{50}$, and with reading glasses he reads Jaeger 6,

Pathological Examination.—There is a swelling with thickened conjunctiva over it at the upper and inner side of the cornea, the margin of which it just overlaps. The iris is detached at its ciliary margin furthest removed from the seat of rupture. The anterior chamber is deep with some hyphæma. There is a large arcus senilis especially below. T. slightly—. Iris greenish in colour and velvety, but not dull. The swelling consists of lens, apparently in its capsule, beneath thickened conjunctiva. It escaped through a rupture exactly at the sclero-corneal junction, but the opening now appears to be closed with tissue not unlike the thickened conjunctiva over the lens. The iris has a greyish exudation on its posterior surface. The ciliary body and anterior part of the choroid is thickened all round, and there are remains of blood between it and the sclerotic.

CASE VII.—*Cataract Extraction (Graefe) with Entanglement of Iris in Cicatrix. Destructive Sympathetic Inflammation about four months later. Excision of Both Eyes.*

Charlotte C., æt. 57. Admitted April 19, 1877.

Left eye. Cataract extraction (Graefe) here in March, 1876; iris entangled in wound at operation, and remained adherent to cicatrix. On discharge then $V\ c + 3'' = \frac{20}{70}$; $c + 2'' = J. 10$.

After going home she "caught cold," and the eye inflamed. Shortly afterwards (in August, 1876) the right eye became inflamed. The condition now is:—

Left. Cornea semi-opaque all over; a. c. very shallow; pupil drawn upwards and quite closed; iris velvety. — T. 3. No perception of light.

Right eye. Cornea slightly opaque; a. c. very shallow; pupil closed; iris velvety and vascular. — T. 1. No perception of light.

She has still pain in both occasionally, worse in right.

27. There have been several severe attacks of pain in and around the right orbit; *right* excised. May 8. The *left* eye has been painful for the last week; excised to-day. Discharged May 17.

This case is given by Mr. Morton in Reports, Vol. IX, p. 337. The increased tension there noted was present in July, 1876. By some mistake the right eye is mentioned as having been then excised.

Pathological Examination.—*Right eye.* Globe slightly shrunk; cornea small, especially in vertical diameter. *Equatorial section.* Vitreous absent, and replaced by a thin, yellowish fluid; retina loosely *in situ*. There are numerous plates of cholesterol in the retina and between it and the choroid. Lens small and *in situ*, adherent to posterior surface of iris; the latter is greatly thickened and in contact with, but not adherent to the cornea. The ciliary body is considerably thickened; this thickening extends 7 mm. backwards into the choroid, becoming less gradually up to this point.

Left eye. Globe rather small (but less so than right) and squared. T. —. Cornea of normal transverse diameter

(11·5 mm.), but only 8·75 mm. in vertical: it is clear. Iris is situated close to posterior aspect of cornea; its front surface appears very finely honeycombed, with close, whitish-yellow deposit on it. Pupil not visible, ? drawn up or closed. *Equatorial section*:—Retina has umbrella-shaped detachment, soft, and greyish-white. Its posterior part is cord-like; its anterior part is semi-contracted—nothing noted in its cavity. Between retina and choroid are abundant cholesterin crystals. Choroid *in situ*, of a light buff colour, finely mottled with pale-brown pigment dots formed by enlarged and altered epithelium cells. *Vertical section of anterior half of globe*:—Iris is apparently considerably thickened; it is adherent to the cornea, greyish in colour, and slightly gelatinous-looking on section. The ciliary body is also thickened, but this condition does not appear to extend into the choroid.

CASE VIII.—*Cataract Extraction followed by Iritis. Secondary Operation two months later. Severe Sympathetic Inflammation about ten weeks after Extraction. Excision of Sympathising and Retention of Useful Vision in Exciting Eye.*

William G., æt. 62. Admitted May 31, 1877.

Left eye. Modified Graefe extraction here last March; lens came away well. Considerable infiltration of edges of wound followed; healing slow, with iritis. There is now thick opaque membrane in the pupil, which is somewhat drawn up. An incision made to-day from below with a broad needle, preparatory to an iridectomy. The needle cut a small hole in the lower part of the opaque membrane, which gaped from bulging forward of a bead of vitreous, forming a good round pupil: it was therefore left till the visual result should be ascertained. June 2. V not improved by operation. Discharged June 11.

Re-admitted June 28. Shortly after going home the *right eye* became red and painful, and has continued so ever since. There is now much ciliary and sclerotic injection. Pupil very irregular under atropine; many posterior synechiæ. In great pain sometimes. *Left eye.* Sight more dim for last day or two. No acute inflammation. Ordered hot belladonna fomentation, Gutt. Atrop., mercurial inunction, Heurteloup to temple, and quinine internally. The severe attacks of pain continued, occurring at inter-

vals of about a week, and worse during the night; generally relieved by Heurteloup. Had one very severe attack of pain lasting several days, not relieved during that time by any treatment. August 26. Slight salivation; no material improvement in eye. September 3. Much pain in right ear and in vertex. 13. Excision of right advised. 17. Continued pain in eye and head. *Right*. Iridectomy attempted downwards; only a small piece from pupillary margin obtained. 20. Pain has been more severe since operation. *Right* excised. 28. *Left* $Vc + 2\frac{1}{2}'' = J. 20$ at $5''$. Discharged.

Re-admitted May 29, 1878. *Left* eye. Slight conjunctival and tinge of ciliary injection; no pain nor tenderness. T.n. Pupil as before. 30. Iridectomy down and in; good coloboma left; slight bleeding. June 4. Small clear space near outer periphery of coloboma; remainder covered by membrane. $Vc + 3\frac{3}{4}'' = \frac{20}{200}$ barely, not improved by cylinders; $c + 2\frac{1}{4}''$ spells J. 16, slowly. Discharged June 6.

Pathological Examination.—T. —. Globe of normal size, and sclerotic of about average thickness; no anterior chamber. There is an artificial coloboma below, partly filled with loose pink lymph. *Equatorial section*. The place of the vitreous is occupied by a thin yellowish fluid. Retina and choroid *in situ*. Optic disc slightly hazy and its blood-vessels small. The lens is cataractous, and is almost concealed from behind by a white, semi-opaque, rather pearly-looking layer of lymph, thinner near the lens periphery; but in this latter situation there are some more or less isolated whiter nodules of the same character. The ciliary processes, especially their anterior parts, are covered with dirty whitish-grey, rather flocculent lymph. This latter forms a well-defined layer to the outer side, but extends inwards for some distance into the vitreous as threads or fibres between ciliary processes and lens. Posterior to the ciliary processes is an irregular band without pigment; the rest of the choroid is about normal. The centre of the lens is yellowish and firm, its margin clear and soft. The iris is adherent to the lens below, but seems free elsewhere.

CASE IX.—*Wound in Ciliary Region, followed by Destructive Sympathetic Inflammation, commencing about ten weeks after Injury. Ultimate Recovery of Useful Vision in Wounded Eye.*

William L., æt. 11. Admitted February 26, 1877.

Right eye. Wounded by a sharp piece of sheet tin, in the middle of last December. There is now a horizontal linear cicatrix passing through the outer third of the cornea into the ciliary region. It has not been painful.

Left eye. Dimness of sight and pain commenced four days ago. Cornea is hazy, with ciliary injection below; no synechiæ; vitreous seems clear. Ordered Gutt. Atrop., Heurteloup, quinine, dark shade.

March 12. *Left.* Cornea more steamy; pupil widely dilated; no pain. April 19. *Left.* Well marked keratitis punctata; pupil widely dilated; eye continues irritable. $V_c + 10'' =$ Jaeger 6 (letters). *Right* reads Jaeger 20. Pupil covered by thin membrane, and does not dilate with atropine. Fundus barely illuminated; no details ascertained. There is a track of opacity behind iris, at seat of wound. May 21. No pain in either; says he sees better. *Right eye* reads Jaeger 16; *left eye* reads Jaeger 19, barely. The increased defect in the left is due to an increased opacity of Descemet's membrane; iris swollen. *Right eye.* Cornea quite clear; ciliary region still slightly congested. June 11. *Right* $V = \frac{20}{200}$, and reads small words of Jaeger 4. *Left* reads Jaeger 16, and letters in Jaeger 14. Discharged.

Examined on Aug. 13. *Right* $V = \frac{20}{200}$, and small words of Jaeger 1. *Left* can barely distinguish large objects; cannot count fingers.

Examined on Jan. 3, 1878. *Right eye.* No pain. T.n. Opacity in lens? traumatic. Reads Jaeger 2, slowly, and some words of Jaeger 1. *Left eye* has sometimes stabbing pain. + T. $1\frac{1}{2}$. Cornea hazy. Ciliary region much injected and bulging. $V =$ bare perception of light.

CASE X.—*Peripheral Corneal Wound. Sympathetic Inflammation about three months later. Useful vision retained in each, better in the Injured Eye.*

James T., æt. 15. Admitted Nov. 25, 1876.

Right eye. Old penetrating wound of cornea from blow with a hard piece of mortar six months ago. Cicatrix at upper inner corneal periphery, with anterior synechia; no pain. Keratitis punctata. T.n. V = fingers at 4 feet.

Left eye. Sight began to grow dim about three months ago. Keratitis punctata. Over the entire posterior surface of the cornea are small grey punctiform opacities, decreasing in size and number above. T.n. V = fingers at 15 inches. Ordered gutt. atrop., iodide of potassium and mercurial vapour-bath. Dec. 7. Improving slowly; slight salivation. *Left* counts fingers at 18 inches. 9. *Left* counts fingers at 5 feet. 12. *Left* counts fingers at 6 feet. *Right* counts fingers at 9 feet. Discharged Dec. 23.

Examined Feb. 25, 1878. *Right* had iridectomy done upwards elsewhere one month ago; slight bulging at recent scar. T.n. Posterior synechiæ. V = fingers at 7 feet. *Left* T.n., or + T. 1? Pupil excluded and occluded. Counts fingers at 5 feet. There is much organised lymph in both pupils.

CASE XI.—*Iridectomy for Glaucoma, followed by Mild Sympathetic Inflammation three months later. Excision. Good Result.*

Samuel W., 50. Admitted August 13, 1877.

Right eye. Iridectomy was done here fourteen weeks ago for glaucoma. At that time there was commencing ulceration at the upper corneal margin. The incision was made downwards, but in the usual manner; the iris tore readily, and part was left in the wound. Since then the ulceration extended over the whole cornea, and now the globe is injected, but not painful.

Left eye. Sight began to grow dim about a fortnight ago. No pain. Well marked keratitis punctata (no note of tension).

Right excised. Treatment.—Shade and dark room; no atropine. 18. Pupil dilated and inactive. 29. Pupil rather dilated,

but moderately active. T.n. Small dots of lymph at margin of iris and on anterior lens capsule. $V = \frac{20}{30}$ not improved by glasses; with + 24" reads Jaeger 1 at 10". Discharged Aug. 30.

Examined on Feb. 25, 1875. Still small punctate deposits on back of lower part of cornea; pupil fairly active. T.n. $V = \frac{20}{20}$ almost perfectly, and c. + 24", reads Jaeger 1 at 10" to 12". He has occasional attacks of dimness in the morning, lasting for some hours; slight haziness of the margin of the optic papilla. His manner is highly agitated, and he trembles much. Smokes $2\frac{1}{2}$ ounces tobacco weekly.

CASE XII.—*Injury and Panophthalmitis of One Eye; Excision six weeks later. Occurrence of Rather Severe Sympathetic Inflammation a few days after Excision. Vision Improved by Iridectomy. Removal of Lens with bad Result.*

Frances L., æt. 59. Admitted December 11, 1876.

Left eye injured about seven years ago by the bursting of a ginger-beer bottle. Removed six weeks after injury. *Right* eye. Sympathetic inflammation commenced some days after the removal of the left. The old notes of this case are, shortly, as follows:—"Sept. 23, 1869. *Left*. Injury by bursting of bottle; cornea divided; panophthalmitis. 24. *Left*. Excised. 28. Discharged." Re-admitted "Oct. 5, 1869. *Right* eye was quite well at time of excision of left. Now sympathetic ophthalmia; iris indistinct; pupil oval horizontally, irregular, undilatable; slight pain; vision much impaired. T.n. Anterior chamber very small. Has eczema of head. Ordered atropine and fot. bellad. 10. Much improved; no pain; pupil more dilated, and iris distinct. 16. Vision improved. Discharged." Re-admitted "Nov. 18, 1870. *Right* eye. Sympathetic iridochoroiditis; pupil occluded; bare perception of light. + T. 1. 23. Iridectomy; iris very friable, only a small piece removed. 28. No pain. T.n. Very fair coloboma. Dec. 3. Eye quiet. Discharged." Re-admitted "May 5, 1873. Iridectomy done so as to increase the size of the old coloboma. Did well for four days, then slight attack of erysipelas, and discharged."

On examination now the right eye counts fingers at 14 inches. + T? Surface of lens covered by a dense mass of uvea; at one or two points where this is absent the lens looks opaque. A fine needle was used to detach the wall and capsule all round; then a small incision was made with a keratome, and as much as possible of the capsule removed with iris forceps. The lens was then extracted; it was partially opaque with striæ. 14. There has been œdema of the lid, and some pain in the eye. Using belladonna fomentation and daturine drops. 16. Still considerable œdema; eyelids and cheek erythematous; eye looking well. Is now using poppy fomentation, and having quinine and iron internally. 28. — T.? Occasional shooting pain. 30. Discharged. She was examined on Feb. 25, 1878. Pupil quite blocked; iris drawn up. T.n., or slightly minus. Bare perception of light. Has occasional photopsiæ; lacrimation on exposure.

CASE XIII.—*Penetrating Wound of Globe, followed by Sympathetic Inflammation three weeks later. Excision of Injured Eye five days after commencement of the Inflammation. Result satisfactory.*

Louisa P., æt. 4. Admitted December 19, 1877.

Twenty-six days ago she fell on a fork, one prong of which penetrated the left lower eyelid in a direction upwards and inwards, and entered the corresponding eyeball. She had great pain in this eye for the first day; since then she has complained chiefly of pain in the left temple. Five days ago the right eye became painful, and has continued so ever since, with occasional remissions. *Left eye.* Just outside the corneal margin, down and in, is a round cicatrix with an anterior synechia; thin layer of lymph in the pupil and posterior synechiæ; anterior chamber shallow below. *Right eye.* Ciliary injection; slight muddiness of aqueous fluid; iris looks woolly; pupil irregular from posterior synechiæ. *Left* excised on admission. Ordered atropine drops to R.E. six times daily; dark bandage. On Jan. 9, 1878, the right pupil was well dilated. Discharged. Examined March 15, 1884. The right eye is still occasionally painful, and there is much lacrimation. There is also sometimes pain in the left socket. There are two leucomata on the right

cornea, near the centre; these were first observed about four years ago, after having her eye inflamed. Pupil dilated to medium size under atropine, and covered with thin layer of organised lymph. T.n. Spells Jaeger 16 with difficulty.

Pathological Examination.—No anterior chamber below, but elsewhere it is of its usual depth; iris flocculent; pupil excluded; lens cataractous. *Equatorial section*:—Vitreous shrunken to a small yellowish-green globular mass at back of lens, behind which is a yellowish, thin, clear fluid. Retina and choroid *in situ*. Optic disc swollen, blood-vessels very small, margin hazy and indistinct. Choroid not thickened to the naked eye, but it contains some clusters of inflammatory cells distributed at intervals in its middle strata. In the anterior part of the globular vitreous is a yellowish-white nodule of lymph, close in front of which is a layer of dark extravasated blood, and close to this again is the lens. The latter is clear, except at track of wound which leads towards the lymph in vitreous. Iris adherent to wound, and enormously thickened by inflammatory cells in its stroma. Similar cells are found among and behind the scattered pigment granules of its uvea. Numerous inflammatory cells in connective tissue lining the ciliary muscle internally and in the anterior part of the choroid.

CASE XIV.—*Penetrating Wound of Globe followed by Sympathetic Inflammation about three months later. Result unfavourable.*

Charles F., 5, admitted June 11, 1878.

The right eye was wounded with a rather blunt-pointed three-pronged corn-rake about the middle of last August. In the middle of November the left eye was noticed to be red and dim-sighted. No particular pain has been complained of. *Right eye.* Large cicatrix at corneal margin up and in. Iris very vascular and drawn towards cicatrix. Cornea nebulous. — T. 2. No perception of light. *Left eye.* Cornea hazy. Iris vascular. + T. 2. Bare perception of light, but much photophobia. Ordered atropine drops frequently. Inunction with mercurial ointment to slight salivation. June 26. *In statu quo.* Discharged. No subsequent account could be obtained.

CASE XV.—*Severe Pain in an old Lost Eye followed by Sympathetic Inflammation of a most Intractable Nature. No Benefit from Excision of the Exciting Eye. Operation for Secondary Glaucoma followed by Relief of Tension, but no Improvement of Vision.*

Martha C., 28. Admitted Jan. 14, 1878.

The left eye was inflamed after measles in early childhood, and has been blind ever since. About seventeen months ago it became very painful for the first time, and then also the right eye became dim-sighted, especially in the evenings. There has been no pain in the right, and laceration only on getting up and going to bed.

Left eye. Cornea prominent, with large nebula. Ciliary injection and stretching. Pupil small and inactive. Lens hazy. + T. 2. Bare perception of light. Much convergent strabismus. *Right eye.* Pupil eccentric down and in. Acts imperfectly to light. V not tried accurately on admission. 15. *Left* excised. 19. *Right.* Pupil bound down. One or two minute dots on Descemet's membrane. $V = \frac{20}{50} \text{ Hm } \frac{1}{36}$.

Jaeg. 1 at 8" slowly. Ordered atropine drops four times daily. 25. Vision unaltered. Pupil very slightly dilated; iris bound down at pupillary margin with lymph. No pain. T.n. Discharged Jan. 29.

Re-admitted May 28. For the last seven days there has been pain in the right eye and catarrhal discharge. *Right.* Lids slightly swollen. Much conjunctival injection. Pupil excluded. Iris bulged. Anterior chamber shallow. T.n. or slightly —. Bare perception of light. Severe pain in eye and right side of head. Ordered black bandage, atropine drops, two leeches to temple. This severe pain continued, but was always relieved temporarily by leeching. June 6. Ordered Hydr. c. Cret. gr. 1, ter in die. 10. Has severe right hemicrania. Occasional pain in eyeball. shooting to whichever side is dependent. + T. 1 or more. 12. Eserine drops four times daily. 18. Eserine discontinued; it seems to increase the pain. T. still +. 20. Mercurial inunction. 21. Slight salivation; discontinue mercury. 24. Iris much bulged forwards. The pain is not severe now, and she feels

better in herself. July 4. Has complained of pain in both legs, and inability to stand well for the last few days. The cutaneous sensibility of the left leg is diminished. Menstruation regular but scant. Aug. 13. Ciliary staphylomata appearing diametrically opposite one another above and below, the one is up and in and the other down and out. V = hand-reflex barely. Sept. 3. + T. 1 or more. No pain for last month or more. The pupil is occluded by a thin membrane, allowing a faint reflex from fundus. The staphylomata are increasing in size; there is now a third one just midway between the other two in the outer ciliary region. Sept. 10. Incision made through outer part of cornea with linear knife. Iris seized with forceps and dragged from its ciliary attachments all round, and removed *en masse*. A little soft lens matter escaped, from injury either with the knife or forceps-traction. Remainder of lens left in position. Blood in front part of eyeball. 16. Eye quiet. Lens opaque. Staphylomata much lessened in size. Oct. 10. Eye fairly quiet. Bare perception of light. — T. 1. Discharged.

Examined March 12, 1884. The right eye is somewhat shrunken. T.n. No perception of light. Large opacity, involving entire cornea, with the exception of two small areas at upper periphery. This opacity is partly superficial but principally deep. No fundus reflex anywhere.

Pathological Examination.—Globe of normal size. T +. White semi-opaque nebula, not very dense, in centre and lower part of cornea. Anterior chamber fairly deep. Iris somewhat woolly. Pupil not perfectly round.

Equatorial Section:—Vitreous is fluid in the centre; its peripheral part is firm and in position, but separates readily from the retina. Optic disc deeply cupped in centre; arteries small; veins of fair size. Sclerotic about normal thickness. Lens clear, *in situ*. Iris thinned, with absence of uveal pigment all round the pupil, but especially on outer side below, where it presents a papery appearance. Greyish white patches from loss of pigment on posterior part of ciliary body, and similar areas just behind ora serrata. *Microscopical Examination.*—Ciliary body atrophied, especially as regards its muscular fibres; ciliary folds shrunken; circulus arteriosus somewhat large. Base of iris adherent for a considerable distance, and much thinned; iris generally atrophic, containing some excess

of nuclei. Canal of Schlemm small, occupied by blood corpuscles, and surrounded by a few inflammatory nuclei. Posterior part of pars ciliaris retinæ is cystic. Considerable exudation extending from adherent base of iris for some distance on to adjacent posterior elastic lamina; it is almost structureless, a few nuclei only being visible in it. A central funnel-shaped pit occupies about one-half of the optic disc, extending nearly down to the lamina cribrosa, which latter is pushed back into a marked curve. Sclerotic over intersheath space on outer side of disc is much thinned, as is also the corresponding part of choroid and retina. Nerve-trunk inflamed, with some increase of connective tissue.

CASE XVI.—*Panophthalmitis following Cataract Extraction. Sympathetic Inflammation about ten weeks later. Excision of Shrunken Eye. No Improvement.*

Edward J. G., 60, admitted Feb. 9, 1878.

Right eye. Cataract removed here last October. Notes as follows:—"Right. Cataract mature. Pupil active. T.n. Good perception of light. *Left.* Cataract immature; pupil active. T.n. He says his health is fairly good, but he looks delicate, and has been subject to bad bilious attacks. Oct. 27. *Right.* Graefe extraction (under chloroform, not sick). Lens soft and came away well. At evening visit there was slight mucopurulent discharge on bandage; he fainted while being dressed. 31. Panophthalmitis; cornea sloughing. Nov. 22. Had much pain in right eye last night. The sight of the left was very dim for some time this morning. Discharged Nov. 28."

About three weeks ago he first felt pain in the left eye, which was then bloodshot. There was also severe pain shooting from the right parietal region to the left temple, and thence round to the left occiput; this has continued more or less ever since. The sight became very dim on the same day as the pain began. There is much tenderness in scalp over the vertex. *Right.* Globe much shrunken, slightly vascular; puckered cicatrix corresponding to operation wound with small round fleshy swelling just above it on the conjunctiva. *Left.* Ciliary injection. Pupil irregular and does not dilate well. T.n. or slightly—. V= bare perception of hand-reflex. *Right.* Excised. Ordered atropine

drops and dark bandage. March 2. The pain has continued to recur at intervals in the left temple and occiput. Mercurial salivation following inunction seemed to lessen this. *Left.* — T. 1. Bare perception of hand. Iris discoloured. Pupil bound down. Cornea cloudy, but no distinct dots visible. Still slight pain in temple and tenderness of scalp. Discharged.

Pathological Examination.—Globe small, especially in antero-posterior diameter. Cornea very small. Just above the operation wound is a small projecting vascular boss; a deep narrow groove leads from this to upper equator. *Equatorial Section.* Globe cuts firmly. Sclerotic swollen, measuring 2 mm. in thickness. Choroid enormously thickened (7 mm.), its inner boundary only indicated by a black ill-defined line. Its substance is greyish white, tough, and somewhat translucent, and extends as such right out to sclerotic. Ciliary body and iris similarly greatly thickened; their uveal pigment much thickened and irregularly scattered. Anterior chamber absent, but iris not adherent to cornea, except at the scar. No trace of lens; retina also indistinguishable, but centre of globe occupied by tough fibrous tissue in which are embedded several calcareous particles.

Microscopical Examination.—Great increase of nuclei in sub-conjunctival tissue at upper corneal margin. The middle of the wound itself is quite 2.5 mm. in front of the canal of Schlemm, which latter is well seen. Extreme peripheral part of cornea much thickened and projecting into anterior chamber. Posterior elastic lamina much undulated. Ciliary body and iris much thickened by exudation on their internal aspect, where it is mixed with much scattered pigment derived from the uveal layer. Substance of ciliary body and iris also infiltrated with numerous inflammatory cells. Choroid enormously thickened on either side of optic disc; it is made up of ill-defined fibrous tissue in which are embedded, especially towards its outer part, large ill-defined clusters of faintly staining nuclei. Interstitial pigment cells of choroid indistinguishable. Retina detached into a cord which loses itself on the tough mass previously described in the centre of the globe. Long ciliary nerves and arteries surrounded by a great number of inflammatory nuclei, which latter have to a comparatively small extent extended into the nerves themselves, half of the long internal ciliary, however, remaining free. Optic nerve-trunk shows marked degene-

rative changes, and contains new inflammatory tissue, both cellular and fibrous.

CASE XVII.—*Lost Globe from Injury. Sympathetic Inflammation about a month later. Excision of Injured Eye. Iridectomy in Sympathising Eye. Result fairly good.*

James A., 45, admitted Sept. 24, 1878.

Right eye.—Injured last May by blow with a sharp piece of wood, which deprived it of sight. It was excised elsewhere on June 18. *Left eye* began to look red, with some pain and some photophobia a week before removal of right. After the excision the left eye became a little better, but has been painful at times ever since. The pupil is excluded and occluded; anterior chamber shallow, but no apparent bombiness of iris. Ciliary injection. T.n. Ordered Fot. Bellad. and Gutt. Atrop. Oct. 22. *Left.* Iridectomy inwards. Nov. 8. Eye fairly quiet. Counts fingers with difficulty at 3 feet.

CASE XVIII.—*Severe Sympathetic Inflammation occurring some months after Cataract Extraction in the other Eye. Excision of the Sympathising Eye. Retention of Fairly Good Vision in the Exciting Eye.*

Sarah B.,* æt. 67. Admitted Sept. 7, 1878.

Right eye. Cataract extraction here in August 1877. The notes then are, shortly, as follows:—" *Right*, Cataract mature; pupil active; T.n.; good perception of light and good field. *Left*. Cataract nearly mature; pupil active, &c.; can almost count fingers. Aug. 30. *Right*. Graefe extraction; a little soft matter left. Sept. 6. Large prolapse of iris through inner half of incision. Oct. 1. Eye keeps irritable; prolapse snipped off. 23. Pupil closed; iris drawn up; slight thick hypopyon. Discharged." She now states that a few months after her discharge the left eye became painful, and has been so, more or less, ever since; sometimes the pain is very severe. *Right*. Pupil drawn up and filled with opaque membrane and ? lens matter; anterior chamber exceedingly shallow; iris seems in contact with cornea

* This patient is one of four sisters who have been operated on here lately for senile cataract.

in several places. T.n. Eye quiet. Good perception of light. *Left.* Iris much thickened, and in contact with cornea. T. + 2. V = light perception. Ordered Fot. Belladonnæ. 19. The left eye continues liable to severe attacks of pain, and was *excised* to-day. 23. Discharged. Doing well.

Re-admitted Oct. 7, 1878. *Right.* Pupil drawn up and blocked; iris in apposition with cornea down and in. T.n. V = bare perception of large objects. 10. Weiss' scissors used from outer side, and good slit made. Considerable loss of fluid vitreous. 14. There is still a good pupil. 22. *Right.* c + 3 $\frac{1}{4}$ V = $\frac{20}{100}$. No distinct improvement with cylinders. c + 2" reads Jaeger 10 at 6". Discharged Oct. 26.

Pathological Examination.—Globe normal size, T. + 2. No anterior chamber. Iris: pupillary margin irregular and dark, surface dull and closely applied to cornea. Pupil presents an opaque, white, spermaceti appearance.

Equatorial Section. Sclerotic not thickened. Vitreous appears as a small, translucent, semi-gelatinous globe on posterior surface of lens and ciliary processes. Posterior to this, and occupying the space between this and the retina, is a thin fluid. Optic disc ill-defined, and looks large; not cupped. Arteries small, with perivasculitis; veins rather large.

Vertical Section of anterior half. Pupillary margin of iris adherent to anterior lens capsule. Lens *in situ*; its nucleus moderately firm, periphery soft. On internal surface of choroid, especially near the inner equator, are very numerous colloidal particles.

CASE XIX.—*Sympathetic Inflammation occurring three weeks after Injury. Result Unfavourable.*

Philip L., æt. 7. Admitted Jan. 31, 1878.

Right eye. Wound with tip-cat at corneal periphery, close to ciliary region, four weeks ago. Has been rather painful lately.

Left eye. One week ago this eye became dim-sighted. It has not been painful. Much pink ciliary injection. Counts fingers with each eye at about 2 feet.

Ordered atropine drops to both eyes, and Hydrarg. c. Cret. gr. 1 ter in die.

Feb. 4. *Left.* Pupil round and well dilated; ciliary region congested; much lacrimation in both.

Feb. 13. *Left.* More injection; eye very watery; anterior chamber deep; iris slightly discoloured; counts fingers at about 9 feet.

Right. Much lacrimation; counts fingers at 1 foot with difficulty.

Feb. 14. *Left.* Pupil round and nearly wide. *Ophthalmoscopic Examination.*—Vitreous cannot be properly examined owing to photophobia and lacrimation; fundus well illuminated: some retinal vessels seen clearly, but optic disc could not be examined. T.n. Ordered Hydr. c. Cret. gr. 2 ter die.

Feb. 15. Much pain in left eye this morning. Much ciliary injection. — T. 1. To have two leeches to left temple.

Feb. 18. To have pills four times daily.

Feb. 21. Continue pills. To rub in 5 grains of mercurial ointment daily.

Feb. 25. Rub in 5 grains twice daily, in addition to the pills.

March 1. No effect yet from the mercurials.

Right. Iris vascular and bulging; pupil excluded and occluded. Bare perception of hand.

Left. Cornea steamy, with a few minute points on posterior surface, and a large deposit at lower part. Pupil excluded?; iris bulging slightly, but fairly dilated. Great photophobia. No pain. Counts fingers at about 18 inches.

March 5. Discharged.

From March 7 till June 28 he was an in-patient at the London Hospital. His right eye was excised there, and the left treated with atropine and belladonna fomentations.

Examined July 30, 1884. The left is now a shrunken stump, with absolutely no perception of light.

CASE XX.—One Eye Lost and Shrunken from Old Inflammation following Injury. Sympathetic Inflammation several years later. Ultimate Improvement from Iridectomy.

George S., æt. 55. Admitted June 22, 1878.

Left eye excised here eight years ago. The notes taken then are:—"May 12, 1870. Left eye lost ten years ago; result of injury by blow. It was operated on here (nature of operation

unknown). It is now shrunken. The right eye has seemed in a fog for the last week, with muscæ. Pupil acts well, but there are posterior synechiæ under atropine. Fundus seen hazily; no lesion visible. $V = \frac{20}{50}$, and letters of Jaeger 2. May 19.

Left. Excised; detached choroid, &c."

Now the right eye is in the following condition:—The iris is slightly velvety. Good anterior chamber. Pupil reacts partially and feebly to light; it is occluded, and there are several posterior synechiæ. Lens cataractous. T.n. or full. Counts fingers at $4\frac{1}{2}$ feet. 24. Iridectomy down and in. To wear a black bandage and have mercurial inunction. July 11. Eye doing well; gums touched; stop inunction. 16. Reads Jaeger 18 from 8" to 24". Iris now is of almost natural appearance; not velvety. Good fundus reflex, but no accurate details. The lens opacity is chiefly nuclear. Discharged to-day.

Examined May 10, 1884. *Right.* Good coloboma. Iris looks normal. Nuclear haze of lens. Reads Jaeger 14, barely. He says *right* was first affected about three years after operation on *left*.

(To be continued.)

